TEACHER LANGUAGE IN THE CLASSROOM

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CHAPTER I

THE ENQUIRY

This study is an exploratory investigation into certain aspects of classroom verbal interaction by means of an analysis, description and comparison of teacher language and certain pupil differences found during six Form II and eight Form III classes in the course of 42 prescribed social studies lessons.

Transcriptions of recorded lessons were analysed to obtain certain language variables and the resulting measures were related to pupil variable measures. The teacher language variables were:

1. the logical structure of units of the verbal interaction as indicated by question types,
2. the content relevance of these units,
3. the purpose and content relevance of teacher monologue explanations,
4. the linguistic structure of teacher monologues,
5. the discourse style employed.

The pupil variables were:

1. measures of intelligence and associative reasoning,
2. attainment in terms of understandings acquired in the course of the three lessons and tested by means of a pretest and a post-test,
3. attitudes toward and interests in school subjects as indicated in questionnaires,
4. other background differences such as parents' socio-economic status, prior experience, and

availability of resource material.

The prime interest which motivated the study and the significance of research such as this are outlined in the following general statement.

(a) GENERAL INTRODUCTION

Teacher Language

Language is the basic means of communication in the classroom. It models and moulds the thinking of the participants in the activities of the classroom; it conveys ideas and experiences, both trivial and profound; it regulates the behaviour of both teacher and pupil; it is creative, productive and expressive. But the language of the classroom is a unique subsystem within the general language communications system.

Gilbert Ryle[1] suggested "no one could follow or use didactic discourse who had not already learned to follow or use conversational talk ... Didactic discourse is itself a species of studied discourse ... in which schooling is given ... and is itself, in some degree, the product of schooling ... Even if a bright conversational style is affected a merely conversational reception of it is known to be inappropriate, so the conversational style is recognised to be fraudulent. The teacher is pretending that he and the pupil are not really working."

Classroom discourse has been likened to a

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[1] Gilbert Ryle. 1968. The Concept of Mind. Australia: Penguin Books.

"language" game[2] in which each "move", a language unit in the lesson, is directed and restrained by rules pertaining to the participant's classroom role. According to Bellack the "fundamental pedagogical pattern" in classroom discourse consists of a sequence of teacher question, pupil response, and usually a teacher reaction. The initiation of these "moves" is the function mainly of the teacher.

Perhaps the teacher determines also the discourse "styles", that is the modes and levels of expression created by syndromes of oral language mannerisms. If Ryle[3] is correct, then a feature of the classroom language game may be that the language style employed by the teacher has a markedly different nature from that used by the pupil. Not only could the linguistic action and style be teacher generated and controlled; the linguistic structure and the vocabulary could be teacher-oriented in their complexities and levels of difficulty or conversely the teacher may employ pupil-oriented, simple language structures and vocabulary levels.

The fact that the teacher may have a "dialect" would add a priestly quality to his classroom role. Although he and the pupils probably have a common social-class origin in New Zealand, the teacher's educational and experiential background could allow a

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[2]Arno Bellack et al. 1965. The Language of the Classroom. Parts 1 and 2. Co-operative Research Project, Columbia University.

[3]G. Ryle. Op.cit.

"language-class" difference to develop which makes the teacher, in this respect, of higher rank.

The teachers in New Zealand primary schools receive their academic education concurrent with or after their professional education. From the time of entry into a teachers' college after secondary education, their professional education includes the experience of teaching and observation in primary school classrooms.

The normal method of secondary-teacher education in New Zealand is by means of a "bridge" professional course subsequent to a secondary and tertiary academic education.

It is not unreasonable to assume that beginning teachers in secondary school classrooms may employ teacher-talk beyond the verbal experience and understanding of the new entrant to the secondary school. Analyses of secondary teachers' and pupils' classroom discourse could show that the teacher-talk was constructed of inordinately more erudite, sophisticated vocabularies, and linguistic structures, and inappropriately higher cognitive levels than the pupil-talk.

If this were shown to be so, then the young pupils in the secondary school would have had to adapt and reorientate to a type of classroom discourse which was different in style and structure and made greater cognitive demands than the primary school classroom discourse with which they were familiar. There is no evidence to show that the articulation between upper intermediate school grades and lower secondary school

grades is a smooth, progressive one; the pupils have not found this to be so. Administrators and teachers have observed that there are problems of adjustment for such pupils. The nature of classroom discourse could be a factor contributing to the difficulties and disillusionment experienced by some secondary school entrants.

Teaching Research and Theories of Teaching

The discourse style is one activity in that set of teacher behaviours which constitutes good teaching. The last two decades have seen the development of new insights and new techniques in teaching research, but relatively little research has been carried out on the linguistic nature of classroom language.

Most analyses of classroom discourse have tended to focus on wide, salient phenomena. Martin[4] in a review of teaching research concluded that "if we are to get to the heart of the teaching act we must finally cope with its subtlety".

The macro-analytic approach taken in most studies of classroom interaction has contributed much to the increasing body of knowledge on teaching. Descriptions of classroom behaviour have been richly provided but generally there has been a focus upon the gross overt behaviours, which do not lend themselves to fine analyses and interpretations.

Having outlined significant current teaching

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[4] R.G. Martin. 1971. "Communication and the Act of Teaching: A Footnote to Models of Teaching". Journal of Teacher Education, Volume XXII, No. 4, Winter, 1971, p. 418.

models of communication in the classroom, Martin[5] concluded that little is yet known about classroom language.

There is no generally accepted theory of language communication, and research findings have provided no resolution of the related problems. There are, however, many accepted linguistic techniques available which could be employed for the analyses of classroom discourse.

Biddle has suggested that the "major field as yet untapped in classroom research is that of linguistics"[6] and considers that it is possible to study the vocabulary, grammar, and lexicon of classroom language. The results of such research would contribute to the body of descriptive knowledge about teaching but they would also add a new dimension to the development of a theory of teaching if their micro-analytic elements were related to pupil variables.

The current models of teaching are products of various theories of learning, counselling, general psychology, or are eclectic, multi-dimensional models. Although components in these models may have some empirical support, none possesses validation obtained from classroom application of the relevant paradigms. A scientifically-based theory of teaching is needed but

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[5] R.G. Martin. 1971. Op.cit., pp. 418-424.

[6] B.J. Biddle. 1967. "Methods and Concepts in Classroom Research" in The Review of Educational Research, Vol. 37, No. 3, June 1967.

has yet to develop. Biddle[7] observes that this lack of a general scientific theory of classroom behaviour exists despite the efforts to utilise traditional theories, or the results of small group research. These have been used for the building of prescriptive theories of teaching but until the full range of behaviours contained within them can be subject to validation we must admit to operating from non-scientific premises.

Teaching Research and Curriculum Development

The changes and developments in curriculum fields tend to follow a classical form:

(a) dissatisfaction is expressed concerning the inadequacies of the current curriculum,

(b) a new curriculum is developed or an old curriculum is modified, or one is borrowed and adapted,

(c) the new curriculum is tested in restricted pilot schemes and either rejected or adopted.

Often disenchantment follows the romantic phase, particularly if the new curriculum has contained seemingly more effective material. It is unusual for curriculum innovations to have suggestions detailing teaching behaviours which have been shown to be effective for use within the new curriculum.

Curriculum development and evaluation of its effectiveness can be facilitated by the use of descriptive data obtained in classroom observations. The results of analytical treatment of the data could provide

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[7] B.J. Biddle. 1965. "Systematic Studies in Classroom Behaviour". Abstract from Doctoral Dissertation, University of Missouri.

a needed means of describing and understanding the teaching behaviours in relation to pupil achievement and attitude within micro-trial, experimental and post-implementation periods.

Barak Rosenshine[8] reviewed studies which used available classroom observation instruments to evaluate curricula. He found that most studies reported that teachers who used the material employed traditional means of instruction; few used special teaching behaviours within the context of the curriculum package. He inferred that descriptions and low-inference measures relating teaching behaviours to student achievement were needed for investigations into the effectiveness of experiments into new curricula. None of the studies included linguistic teaching behaviours.

Probably the paucity of research into such variables in general teaching research explains why they have not been brought into focus in evaluation of methods of instruction in new curricula. For comprehensive and reliable evaluation of these innovations, appropriate observational systems and analytical descriptions are needed. These would enable the identification of critical verbal and non-verbal behaviours needed for new curricula to have potency and for the achievement of curricular objectives.

Teaching Research in Programmes of Teacher Education

It has been suggested that research concentrated

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[8]Barak Rosenshine. 1970. "Evaluation of Classroom Instruction" in Review of Educational Research, Vol. 40, No. 2, April 1970, published by American Educational Research Association.

on verbal and linguistic variables would be a fruitful field for contributing to the understanding of the problems found in junior secondary classrooms, and also would make important contributions to the development of a theory of teaching and for curriculum development and evaluation.

Because such research can contribute to these areas it could also furnish materials and methods for teacher education programmes.

The lack of adequate programmes in teacher education is attributable in part to the insufficient information available on the significant and crucial behavioural components of effective teaching. Rosenshine and Furst observe that there is a new focus on denotable actions in performance criteria[9] in the training of teachers which is indicative of a shift from traditional broad and vague objectives such as 'providing meaningful experiences' and 'providing for individual differences'.

Investigations indicate that those training procedures reviewed by Rosenshine and Furst[10] which concentrated on distinguishable, specific behaviours were more effective than courses employing traditional methods for changing the behaviours of teachers in training. The reviewers see the need for an emphasis on specific performance criteria in the planning of

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[9] Barak Rosenshine and Norma Furst. 1971. "Research on Teacher Performance Criteria" in Research in Teacher Education: A Symposium, edited by B.O. Smith, for American Educational Research Association. Prentice-Hall Inc., New Jersey.

[10] B. Rosenshine and N. Furst. Ibid., p. 38 ff.

model programmes of teacher education. However, there are no repertoires of teaching skills which have been shown from research to produce severally, or in combination, the desirable changes in the cognitive or affective performance of the students. Such research findings would provide the performance criteria needed in teacher education programmes.

Many teacher education courses use the available observational category and rating systems and variables which were found from laboratory experiments to be significant. The affective variables have been studied much more frequently in teaching research; a comprehensive coverage is now needed of the cognitive variables, particularly those relating to the language demands, style, and structure of classroom discourse. These, together with the instruments and methods at present in use in teachers' colleges would make for greater balance and coverage of the important teaching behaviours. The assumption is made that teachers who are aware of and can use a variety of appropriate verbal behaviours will be able to facilitate more learning in their classrooms. Therefore, it is suggested that descriptive and analytical methods of investigating the cognitive and linguistic nature of the language of the classroom would in themselves be effective tools for the production in trainee teachers of sensitivity to the importance of their own language style and structure for the achievement of their pupils. Similarly, the in-service training of teachers could utilise research

findings in these areas for aiding teachers whose sensitivity is already high.

(b) THE SPECIFIC AIMS OF THE STUDY

The study began with the intention of particularly ascertaining:

(1) If there was any significant difference between the vocabulary levels in the classroom language of a group of teachers as shown in judgments obtained from the pupils and from a panel of experts, and

(2) exploring the relationship between teacher effectiveness from measures of pupil achievement and samples of each teacher's classroom lexical level as obtained from word frequency lists.

After a preliminary trial these aims were modified because the following specific variables appeared to be significant on the basis of the author's intuitive judgments:

(1) The number and types of questions in classroom verbal interaction.

(2) The classification of the units of verbal interaction "episodes"[11] according to their relevance and purpose in relationship with the generally prescribed lesson content, and the length of episodes.

(3) The classification of the teacher explanation "monologues",[11] according to their relevance,

[11] G.A. Nuthall et al. 1970. System for Analysis of Verbal Interaction in Class Lessons - 1970 Revision, University of Canterbury Teaching Research Project (mimeographed).

purpose, and design in relationship with the prescribed lesson content.

(4) A determination of the variations between the teachers in the research sample of the lexical levels of monologues.

(5) The analysis of samples of teacher monologues to obtain a description of the "surface" linguistic structure of each teacher's classroom language by obtaining measures of:

  (a) the number of morphemes per group, and

  (b) the various types of phrase subordination structures.

(6) An analysis to provide a description of the "deep structure" of each teacher's classroom language through measures of:

  (a) the frequency of the use of negation,

  (b) the frequency of the use of the passive voice,

  (c) the phrase structure, that is the degree of phrase embedding and branching structures.

(7) A description and comparison of the styles employed by the teachers in their oral language. The "style" of the language being characterised by variables such as the use of idiomatic, figurative, pedantic, and other distinctive features of oral language.

(8) The frequency of the use of vague expressions in teacher explanations.

(9) A measure of the scientific-emotive dimension in teacher explanations.

(c) SUMMARY OF AIMS

These specific aims resulted in the development of the general intentions in this exploratory study:

(1) The description of the patterns of teachers' language; its linguistic structure, vocabulary and style.

(2) The nature of the verbal interaction in the particular type of lesson used in this study.

(3) An examination of the relationship between a selection of these variables and the following:

Pupil achievement.

Pupil interest in this subject and type of lesson.

Pupil assessment of the general difficulty, in understanding these lessons.

Pupil assessment of their ability to understand the language employed by the teachers in these lessons.

(4) Because of the classroom problems experienced by new entrants in secondary schools, to determine any differences there were between the language and aspects of verbal interaction in Form II and Form III classes in the sample used for this study.

(d) OUTLINE OF THE STUDY

The study involved fourteen teachers, eight Form III teachers and six Form II teachers, forty-two lessons on a topic in Social Studies. The lesson topics and treatment were prescribed in outline and sequence only.

The secondary and primary school teachers were matched as much as possible for experience, sex, and type of school.

The lessons were tape-recorded then transcribed. The tape-scripts were analysed to isolate ninety-four teacher differences and sixty-seven pupil differences. Measures were obtained of these differences for each teacher and each class respectively and attempts were made to identify relationships between these.

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CHAPTER II

REVIEW OF THE LITERATURE

This chapter presents firstly an outline of the development of research in teaching, in particular the development of research in classroom interaction in which cognitive and linguistic behaviours have been studied.

The studies reviewed are those in which investigations were made of questions, teacher explanations, discourse styles, and content relevance in teaching. Reviews are also given of studies which relate cognitive and linguistic dimensions of teacher behaviour with pupil achievement.

Secondly, a summary is provided of the literature concerning the tests and other means of measurement used in this investigation.

Finally, there is a presentation and discussion on the theories underlying the linguistic analysis employed. Reasons are given for the choice of the Chomskian transformational grammar together with a summary of Chomsky's linguistic theories up to the end of 1973, his psychological theory and the empirical validation of those theories. The chapter concludes with notes on the significance of the theories for research in teaching.

(A) A REVIEW OF THE RESEARCH ON CLASSROOM INTERACTION STUDIES

(a) The development of research on teaching and classroom interaction

The questions related to what constitutes a good teacher and good teaching have been asked from classical times. However it is only of recent years that studies in teaching have investigated objective measures of teacher behaviours and employed scientific methods in research.

Medley[1] traced the influence of various trends in previous educational research upon modern teaching research. He found investigations into the psychology of learning dominated educational research from the turn of this century and controlled most teaching practices and much of the theory of teaching. Many experiments compared the effectiveness of various methods but not specific teaching behaviours.

Medley considered that the child study movement of the 1930s produced the pioneer work in observational methodology.

During the 1940s, researchers, particularly Olson et al., University of Iowa,[2] Thomas,[3] Anderson,[4]

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[1] Donald M. Medley. 1972. "Early History of Research on Teacher Behaviour", University of Virginia, in International Review of Education, Vol. 18, No. 4 (Special Number), UNESCO Institute for Education.

[2] Olson, University of Iowa (undated). (Mimeographed material.)

[3] Dorothy S. Thomas et al. 1929. "Some New Techniques for Studying Social Behaviour". Child Development Monograph No. 1.

[4] H.H. Anderson. 1939. "The Measurement of Domination and Socially Integrative Behaviour in Teachers' Contacts with Children". Child Development 10, pp. 73-89.

and Jayne,[5] provided the trends toward, and techniques for, objective methods of classroom observation.

These led in the 1950s to teaching research such as that of Withall's investigations into "Classroom Climate",[6] and Flanders' "Interaction Analysis",[7] the most generally used method of analysing classroom behaviour. Medley and Mitzel[8] developed the "OScAR" method of recording observations of behaviour in the classroom.

These were the most influential among the reported studies up to the beginning of the 1960s. Medley[9] notes that of reported studies less than 20 used objective procedures for analysing the classroom behaviours of teachers.

In the past decade there has been a marked development in teaching research in these directions:

1. the general directions possible in the study of classroom behavioural processes,
2. the variables selected within the processes studied,
3. the depth of focus in research,
4. the techniques, instruments, and methods of

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[5] C.D. Jayne. 1945. "A Study of the Relationship between Teaching Procedures and Educational Outcomes". Journal of Experimental Education, 14, pp. 101-134.

[6] J. Withall. 1951. "The Development of the Climate Index". Journal of Educational Research, XLV, pp. 93-100.

[7] N.A. Flanders. 1960. "Teacher Influence, Pupil Attitudes and Achievement". Final Report. Co-operative Research Project No. 397, U.S. Office of Education, The University of Minnesota.

[8] D.M. Medley and H.E. Mitzel. 1958. "A Technique for Measuring Classroom Behaviour" in Journal of Educational Psychology, 49, pp. 86-92.

[9] D.M. Medley. Op.cit.

observation, data collection and treatment of data,

5. methods of analysis, statistical procedures and interpretation,

6. the philosophical, sociological, and psychological implications and problems of empirical studies of interaction in the classroom.

(b) Reviews of research on teaching and classroom interaction

The research studies which have produced these developments have been comprehensively reviewed by Biddle,[10] Meux,[11] Campbell,[12] Nuthall,[13] Westbury and Bellack,[14] and Simon.[15]

Biddle confined his review first to the specific problems related to the variables covered in classroom research. He suggested that most studies give seriously limited coverage to the various types of classroom and the specific variables investigated.

He reviewed, secondly, the methodology of data

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[10] B.J. Biddle. June 1967. "Methods and Concepts in Classroom Research" in Review of Educational Research, Vol. XXXVII, No. 3, pp. 337-357.

[11] M.O. Meux. December 1967. "Studies of Learning in the School Setting" in Review of Educational Research, Vol. XXXVII, No. 5, pp. 539-562.

[12] W.J. Campbell. November 1968. "Studies of Teaching I. Classroom Practices" in N.Z. Journal of Educational Studies, Vol. 3, No. 2, pp. 97-124.

[13] G.A. Nuthall. November 1968. "Studies of Teaching II. Types of Research on Teaching" in N.Z. Journal of Educational Studies, Vol. 3, No. 2, pp. 125-147.

[14] I. Westbury and A.A. Bellack (editors). 1971. Research into Classroom Processes: Recent Developments and Next Steps. Teachers' College Press, Columbia University, New York.

[15] Anita Simon (editor). 1968. Mirrors for Behaviour: An Anthology of Classroom Observation Systems. Philadelphia: Research for Better Schools Inc.

collection. Nonparticipant observation was considered useful if the need was for development of the new concepts and relationships within the classroom social system but, because the observer was required to operate from his own insights, there could be no closer investigation into the variables operating in the classroom nor replication of results. When a rating system was used, there was opportunity for replication but not for closer scrutiny of other than those variables the observer was able to focus upon.

Behavioural recording by means of audio or audio-visual devices allowed for more detailed investigations into the interacting variables of the classroom. Biddle considered that for deep analytical study of classroom processes, audio-visual recording was necessary.

The third problem which was covered in Biddle's review concerned the choices of analytic units. He commended the use of short episodic units for the analysis of classroom processes; irrespective of the model adopted for research purposes, a short analytic unit was employable. The units used in the various classroom observation systems have been described in Meux.[16] He noted that most analytic units were analogous to stimulus-response relations, apart from those systems which had arbitrary time units, for example Flanders' system.[17] But these systems aimed at analyses of classroom behavioural processes other than

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[16] M.O. Meux. 1967. Op.cit.

[17] N.A. Flanders. 1960. Op.cit.

the cognitive processes.

In Biddle's review, the fourth problem "conceptual posture", classified research investigations according to focus in the behaviour observation: intent, effects or objective characteristics of the classroom participants' behaviour. The reviewer considered that any or all of these could be coded legitimately at the individual level but if a broader stance was needed, because social factors are to be investigated, then the emphasis should be on an analysis of the objective characteristics of behaviour.

In the final specific problem, Biddle noted that there was lack of agreement between research workers regarding their underlying conceptual structures. The idiosyncratic nature of analytical systems has been discussed by Nuthall,[18] who suggested that theoretical justification must be provided for any system of analysis.

(c) Research on classroom cognitive and linguistic behaviours

Meux[19] recommended the use of "multi-aspect classroom observation systems" for research in classroom learning. Included in this, he suggested, should be indications of various "thinking" processes, particularly concerning the fundamental problem of conceptualisation. He saw the need for new systems to index attributes of this behaviour, amongst which he included psycholinguistic factors.

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[18] G.A. Nuthall. 1968. Op.cit., p. 129 ff.

[19] M.O. Meux. 1967. Op.cit., p. 558.

Nuthall's[20] review indicated that an insignificant number of studies had endeavoured to examine cognitive or linguistic variables; most studies were devoted to descriptions of ecological, teacher or pupil, and classroom management variables. Although the orientation in the majority of studies had been pedagogical, the cognitive and linguistic variables within the classroom verbal interaction had received little attention.

i. Studies primarily concerned with cognitive and linguistic variables. Bellack et al.[21] directed their research to the analysis and description of the verbal behaviour of teachers and students in high school Social Studies lessons. Part of their reference was the determination of the way language was employed in structuring pedagogical roles.

The analysis of classroom discourse in the study reported by Nuthall and Lawrence[22] was directed to the identification of the cognitive structure and style in molecular verbal events of classroom lessons; however, the concern was with linguistic style rather than its constituent elements as in this research investigation.

Rosenshine[23] pointed out that there was a high

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[20] G.A. Nuthall. 1968. Op.cit., pp. 544-558.

[21] Bellack, Davitz et al. 1965. The Language of the Classroom, Parts I and II. Co-operative Research Project, Columbia University.

[22] G.A. Nuthall and P.J. Lawrence. 1965. Thinking in the Classroom. The Development of Method Analysis. N.Z. Council for Educational Research.

[23] B. Rosenshine. 1969. "New Correlates of Readability and Listenability". Extract from Reading and Realism, pp. 712-76, J.A. Figurel (editor).

correlation between the "readability" of classroom material and "listenability". He found that most investigations of reading difficulty contained three steps which provided a paradigm for his investigations:

(a) investigators ordered materials according to a criterion of difficulty, usually comprehension; then

(b) analysed the materials for internal, linguistic factors which predict variations in difficulty; and

(c) combined the factors most predictive of difficulty into a multiple regression formula.

Rosenshine showed by the use of this paradigm objectively that difficult language contains longer words and longer units of thought.

From this Rosenshine, Gage and others were able to combine a variety of linguistic variables which were useful in studies of comparison among teachers, the traditional type of research. These studies could have significance for studies in teachers' oral linguistic behaviour where comparisons are made of the behaviours at different grade levels.

However, Rosenshine considered that the studies across a period of time by Peterson,[24] Funkhouse[25] and

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[24] E.M. Peterson. 1969. "Aspects of Readability in Social Studies". Columbia University Teachers' College, in B. Rosenshine. 1969. Op.cit.

[25] G.R. Funkhouse. 1967. "Readability in Science Writing". Paper presented to the Association for Education in Journalism in (23) op.cit.

Rosenshine[26] showed that different uses of language produced differences of effectiveness because of these variables:

(i) vagueness

(ii) explaining links

(iii) frequency of examples

(iv) rule-example-rule pattern

(v) irrelevancy.

Hiller et al.[27] found that the incidence in the teacher's vocabulary of fluency and vagueness had a positive correlation with pupil achievement.

In Dell and Hiller's[28] analysis of teachers' explanations there was found again a negative relationship between "vagueness" and explaining effectiveness.

Rosenshine[29] analysed social studies lectures of ten teachers (five "high-scoring", five "low-scoring") in each of three samples: a "hypothesis", a "validation" and a "cross-validation" sample. The variables were classified in nine linguistic categories:

1. Word length

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[26] B. Rosenshine. 1969. "Behavioural Predictors of Effectiveness in Explaining Social Studies Material". Unpublished Doctoral Dissertation in (23) op.cit.

[27] J.E. Hiller, G. Fisher and W. Kaess. 1969. "A Computer Investigation of Verbal Characteristics of Effective Classroom Lecturing" in American Educational Research Journal, Vol. 6, No. 4, November 1969, pp. 661-675.

[28] D. Dell and J. Hiller. 1968. Computer Analysis of Teachers' Explanations. Original Mimeographed Report.

[29] B. Rosenshine. 1968. Objectively Measured Behavioural Predictors of Effectiveness in Explaining. (Mimeographed material.) Presented to American Educational Research Association Symposium on Explaining in Teaching.

2. Words related to the ten criterion questions
3. Length and structure of independent clause units
4. Use of prepositional phrases
5. Readability estimate
6. Personal references (counts of first and second person pronouns)
7. Negative sentences
8. Passive verbs
9. Elongated and fragmented sentences.

For the hypothesis sample only were there any significant relationships; the high-scoring lectures contained fewer syllables per word, more words and phrases per independent clause unit, more prepositional phrases, and more words relevant to the criterion questions used.

Bernstein's[30] audio-linguistic research, by the analysis of tape-recorded data collected under differing circumstances and environments, investigated the difference between different language registers of the

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[30] B. Bernstein. 1961. "Social Structure, Language and Learning" in Journal of Educational Research, Vol. 3, No. 3, pp. 163-76; and also Primary Socialisation, Language and Education. University of London Institute of Education Sociological Research Unit.

Note: The development of this research is found in Primary Socialisation, Language and Education. University of London Institute of Education Sociological Research Unit. Research Reports, B. Bernstein (editor), Routledge & Kegan Paul, London: (1) W. Brandis and D. Henderson. 1970. "Social Class, Language and Communication"; (2) G.J. Turner and B.A. Mohan. 1970. "A Linguistic Description and Computer Programme for Children's Speech"; (3) D. & J. Gahagan. 1970. "Talk Reform: Explorations in Language for Infant School Children"; (4) W.P. Robinson and S.J. Rackstram. 1972. "A Question of Answers".

British working-class and the middle-class. He described these registers as "restricted code" and "elaborate code".

This research, which is still being reported, using very sophisticated techniques, indicated that the whole nature of learning and environmental orientation was restructured when there were fundamental changes in a child's speech patterns. It would appear that similar environments were interpreted differently by the users of the different codes. It was found that greater attention was given to, and greater gain was made by, the users of elaborate code in the classrooms. The teachers were mainly of middle-class origin and used language with "elaborate code".

An outline of the main characteristics of these codes has significance for this present study:

In Restricted Code the sentences had these features:

Limited length

Simple and loose syntactic structure

Frequent use of the active voice

Limited range of adverbs

Limited range of adjectives but frequent use of a few simple adjectives

A significant use of interrogative and imperative structures

Impersonal pronouns had little use but subjective purpose was not presented explicitly.

However, the main features of Elaborate Code were:

Highly complex syntactic structures

Complex phrase subordination

Significant use of the passive voice

Careful selection from a varied range of adverbs, adjectives and prepositions

The frequent employment of impersonal pronouns but subjective purpose is by explicit means.

Barnes et al.'s[31] research used a general approach covering the full range of types of English secondary schools with twelve lessons in all. Using a mixture of high-inference and low-inference measures the teachers' questions and language register were categorised. Vocabulary level was treated on a specialist/non-specialist dimension. Barnes suggested that a "more sophisticated insight into the implications of their own use of language and into the part it plays in pupils' learning would be of advantage to the teacher".

Cambourne's[32] progress reports also have relevance to this study. His research was based on a comparison between different verbal strategies in the classroom, and into the surface-structure/deep structure linguistic analysis of classroom discourse.

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[31] D. Barnes et al. 1969. "Language in the Secondary Classroom" in Language, the Learner and the School. London Association for Teaching of English. In Penguin Papers in Education Series, Penguin Books, Middlesex, England.

[32] B.L. Cambourne et al. 1970. A Linguistic Approach to the Analysis of Classroom Behaviour, and other mimeographed progress reports on research at James Cook University, North Queensland.

A study by Kean[33] employed three coders (reliability .89-.99) to:

Provide segmentation of teacher talk (syntactic units, partials, images)

Analyse the structural patterns of main clauses and functions of subordinate clauses

Index vocabulary diversification.

Findings indicated firstly that there appeared to be little difference in teachers' language between grade levels.

Secondly, findings on teachers' language "calling for speculation" by the pupil showed that while second grade teachers used almost the same percentage of partials as their pupils, fifth grade teachers used more than their pupils; nouns and pronouns were almost the only nominals used by all teachers as sentence subjects but clauses and infinitives were used substantially for nominal complements; words and phrases were used more than were clauses and combinations in adverbial elements by all teachers.

ii. Studies of questions used by teachers. There has been a large number of surveys on questioning in the classroom since 1912 when Stevens[34] found that 80% of classroom time was spent in the asking and answering of

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[33] J.M. Kean. 1968. "Linguistic Structure of Second and Fifth Grade Teachers' Oral Classroom Language" in the American Educational Research Journal, Vol. 5, No. 4, November 1968.

[34] R. Stevens. 1912. "The Question as a Measure of Efficiency in Instruction: A Critical Study of Classroom Practice". Teachers' College Contributions to Education, No. 48.

questions.

Studies undertaken in the last decade have indicated that the questioning practices of teachers had not changed radically in the last half century.

The reviews of Von Balzer,[35] Hoetker and Ahlbrand,[36] and Gall[37] of studies on teacher questions indicated that most research found that about 50% at least of teachers' questions required the statement of facts; about 25% asked questions demanding some sort of reasoning skill; the remainder concerned classroom management and procedures.

Classification of types of questions

The reviewers named above, and Rosenshine and Furst[38] found that the research studies which used types of questions either classified the questions into two broad categories or into divisions based on varieties of types.

Two-type classification of questions

Studies which classified questions into two types used either high-low cognitive operations or open-closed dimensions. The studies did not produce "consistent

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[35] L. Von Balzer. 1970. Review, Appraisal and Recommendations Concerning Classroom Behaviour in Science. Report to Annual Meeting of National Association for Research in Science Teaching, Minneapolis, March 1970. (Mimeographed.)

[36] J. Hoetker and W.P. Ahlbrand, Jr. 1969. "The Persistence of Recitation" in American Educational Research Journal, No. 6.

[37] M.D. Gall. 1970. "The Use of Questions in Teaching" in Review of Educational Research, Vol. 40, No. 5.

[38] B. Rosenshine and N. Furst. 1971. "Research on Teacher Performance Criteria". Op.cit.

significant results or any discernible trend".[39]

Multiple classification of questions

Rosenshine's review above stated that only two studies have been found which used this type of classification. Solomon et al.[40] and Conners and Eisenberg[41] reported studies which, although differing in intentions and procedures, presented significant results. Rosenshine considered that studies which used multiple classifications of questions would be profitable for research.

The Canterbury Teaching Research Project System of Classification

The method of analysis[42] involved a three stage process:

Stage One : Discourse was separated into verbal moves and classified.

Stage Two : Verbal episodes were identified on the basis of the verbal move classification.

Stage Three : The leading questions of each episode were classified on the basis of their dominant logical-cognitive meaning.

The classification of questions into fifteen categories is presented in Appendix 1, page 189.

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[39] Rosenshine and Furst. 1971. Op.cit.

[40] D. Solomon, W.E. Bezdek and L. Rosenberg. 1963. Teaching Styles and Learning. Centre for the Study of Liberal Education for Adults, Chicago.

[41] C.K. Conners and L. Eisenberg. 1966. The Effect of Teacher Behaviour on Verbal Intelligence in Operation Headstart Children. John Hopkins University of Medicine, Baltimore.

[42] University of Canterbury Teaching Research Project. System for Analysis of Verbal Interaction in Class Lessons. 1970 Revision. (Mimeographed.)

This method was adopted for use in this study.

Research studies which compared questioning behaviours of teachers across Form II and Form III classes (Grades 6 to 8 approximately)

Godbold[43] compared the questioning practices of elementary and high school teachers who had different qualifications and teaching experience. This sample was composed of 32 teachers from four junior high schools and four elementary schools in a large metropolitan area. Each question used was categorised according to Sanders' classification[44] by two observers analysing taped 50-minute lessons.

The statistical comparisons revealed that:

1. There was a difference between the number and the cognitive level of the questions asked.
2. At least 54% of questions were in the "memory" category.

Elementary school teachers asked 33.66% more questions than high school teachers; experienced elementary teachers asked 14.2% more questions than the experienced high school teachers but less experienced elementary teachers asked 6.59% more questions than their more experienced colleagues. Experienced high school teachers asked 31.12% more questions than did the less experienced.

iii. Studies of explaining in teaching. Reviews

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[43] J.V. Godbold. 1970. "Oral Questioning Practices of Teachers in Social Studies Classes" in Educational Leadership, Research Supplement to Vol. 1, October 1970.

[44] N. Sanders. 1966. Classroom Questions: What Kinds? Harper & Row, New York.

of research into the teacher's ability to explain have been reported by various writers.

Rosenshine[45] noted that the research in this area had been primarily exploratory, but that results showed significant correlations between effectiveness of explanations and teacher variables, such as gestures, use of explaining links, and incidence of vague words.

Most research studies on the teacher's ability to explain have been conducted either by or under the supervision of N.L. Gage and/or B. Rosenshine. Hiller et al.[46] under Gage's direction analysed 35 categories of significant verbal characteristics in teachers' lecturing behaviours. These were consolidated, on the intuitive judgments of the authors, into a set of five factors: verbal fluency, optional information amount, knowledge structure cues, interest, vagueness. Statistical analysis found the vagueness factor to be strongest in measures of effectiveness related to lecturing effectiveness criteria.

Vagueness was defined as "an excessive proportion of qualification, haziness and ambiguity". The "Vagueness Dictionary" constructed during that research was used in this present study to provide guidance in selecting the "vagueness" words for frequency counts.

iv. Studies of cognitive and linguistic variables of teacher behaviour and pupil achievement. Reviews of

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[45] B. Rosenshine. 1968. "To Explain: A Review of Research" in Research in Review, in Educational Leadership, Vol. 26, No. 3, December 1968.

[46] J.H. Hiller, G.A. Fisher, W. Kaess. 1969. Op.cit.

research and certain research studies which related cognitive and linguistic variables to pupil achievement are considered in this section. Rosenshine's two reviews[47,48] and Soar's review[49] indicated that more research had been conducted into the affective than into the cognitive areas of teachers' classroom behaviours. Many studies revealed significant positive correlations between the frequency of teacher questions and pupil achievement. Wright and Nuthall[50] found a positive relationship between achievement and the percentage of closed questions. Rosenshine reported that research using other two-dimensional or multi-dimensional classifications of questions had indicated that significant positive relationships existed between types of questions used and pupil achievement.

Von Balzer reported[51] that in some research in science teaching a direct relationship was found between lecturing effectiveness and student achievement.

v. Studies of discourse "style" and discourse "relevance". No reported research studies have employed

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[47] B. Rosenshine. 1968. Teaching Behaviours Related to Pupil Achievement. (Cyclostyled research paper.)

[48] B. Rosenshine. 1971. Teaching Behaviours and Student Achievement, published by National Foundation for Educational Research in England and Wales.

[49] R. Soar. 1970. "Teacher Behaviour Related to Pupil Growth" in The Classroom Behaviour of Teachers, No. 7, 1970.

[50] C.J. Wright and G.A. Nuthall. 1970. Relationship Between Teacher Behaviours and Pupil Achievement in Three Experimental Elementary Science Lessons. American Educational Research Journal, No. 7, 1970.

[51] L. Von Balzer. 1970. "Review, Appraisal and Recommendations Concerning Research on Classroom Behaviour in Science". Op.cit.

variables similar to "style" and "relevance" which were used for this exploratory study.

Darbyshire[52] in discriminating between dialect and register defined a dialect as language usage determined by the environment or the social status of a group. Cutting across this is the register of a language, that is the situational context or set of circumstances which elicits it. The context will determine the concern or subject-matter of the utterances constituting the discourse and this dictates the lexis and often the syntactic structures used.

It should be noted that there is overlap between studies of teacher language which deal with the psycho-linguistic and the sociolinguistic investigations. However, the purpose of the discourse analysis in style of teacher language was to describe the differences, if any, between the styles used by teachers of the teacher sample and to describe the common denominators of those teachers' discourse styles.

As with all native speakers of a language, teachers will use a delicate control over their manner of discourse. Here the aim was to describe the style which these teachers found appropriate in the classroom lessons of this study.

As the only language medium concerned in this exploratory study is spoken language, the stylistic features of only spoken English were investigated as examined and specified by some writers on English

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[52] A.E. Darbyshire. 1968. Exercises in Linguistics. Edward Arnold Ltd., London.

stylistics.

Joos[53] specified five arbitrary style divisions in English usage:

1. Frozen
2. Formal
3. Consultative
4. Casual
5. Intimate.

He considered the "frozen" style was that type of English usage which was formal and did not employ any conventional conversational utterances; it was the language of scientific, written prose. Because it was thus constituted it was not expected to be found in the original data of this study.

For the purpose of determining the specific characteristics of each of the other divisions of style various writings[54-59] on English style were examined and

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[53] M. Joos. 1962. "The Five Clocks", and in the International Journal of American Linguistics, Vol. 28, No. 2.

[54] A. Wilkinson et al. 1965. "Spoken English". Educational Review Occasional Publications No. 2. Supplement to the Educational Review, Vol. 17, No. 2, February 1965.

[55] D. Crystal and D. Davy. 1969. "Investigating English Style". English Language Series. R. Quirk (General Editor). Longmans, London.

[56] C.P. Fries. 1958. The Structure of English. Longmans, London.

[57] A.E. Darbyshire. 1967. A Description of English. Edward Arnold Ltd., London.

[58] B.M.H. Strang. 1962. Modern English Structure. Edward Arnold Ltd., London.

[59] G.N. Leech. 1966. "English in Advertising: A Linguistic Study of Advertising in Great Britain". English Language Series. R. Quirk (General Editor). Longmans, London.

from them "style constellations", arbitrary sets of characteristics, were compiled.

In this study another variable of spoken English was measured in the samples of teacher language. Flower's[60] description of "emotive juxtaposition" was used for a count of emotive words in the original transcribed data. Flower stated that such words may have a lack of precision in context having been selected with the incident to give "aura of meaning".

(B) A REVIEW OF THE LITERATURE CONCERNING INSTRUMENTS USED IN THE STUDY

(a) The word association test

The Children's Associative Responding Test devised by Achenbach[61,62] was used in this study. Some minor modifications on procedures were necessary. These modifications are described in the next chapter.

The CART is a multiple-choice analogy test which can be used to provide a measure of general intelligence, but the test was specifically designed to identify children who were dependent upon free association rather than analogical reasoning. Half of the test items had a foil response item which was frequently associated

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[60] F.D. Flower. 1966. Language and Education. Longmans, London, p. 91.

[61] L.M. Achenbach. 1970. "Standardisation of a Research Instrument for Identifying Associative Responding in Children" in Developmental Psychology, No. 2, 1970.

[62] L.M. Achenbach. 1970. "The Children's Associative Responding Test: A Possible Alternative to Group I.Q. Tests". Journal of Educational Psychology, Vol. 61, No. 6, 1970.

with the third word of the analogy. The test was standardised for use with fifth to eighth grade pupils and provided a 'D' score from the difference between the non-foil incorrect items selected and the chosen foil items. This was used to identify excessive reliance on strategies which select obvious cues rather than reliance upon reasoning abilities.

The correlations between the classroom performance (as measured by achievement tests and grades) and ability tests (Otis and Binet Quotients and mental age scores) correlations showed strong relationship with CART 'D' scores. The correlations between various subgroup and other scores with CART raw scores indicated that this test would be an effective means of obtaining a prognosis on a pupil's classroom performance and achievement.

(b) The assessment of vocabulary levels

Various word lists were examined in the search for a suitable and reliable means of assessing the level of difficulty of the lexis of each teacher's classroom language. No suitable New Zealand list could be found.

The Thorndike-Lorge lists[63] were considered unsuitable because they were compiled from analyses of children's literature; there were no means of determining variant meanings between words of the same spelling; and the lists were not graded but showed only frequency of occurrence in a wide range. A trial

[63] E.L. Thorndike and I. Lorge. 1944. The Teacher's Word Book of 30,000 Words. Bureau of Publications, Teachers' College Columbia University, New York.

grouping was attempted but without success because many words employed in samples of teacher-talk in this present study showed little difference in frequency of occurrence in children's literature. However, in other lists the same words appeared in different grade groupings on the basis of frequency counts.

The Dale and Eickholz[64] list was considered to be useful because the lists were obtained over large samples, across a range of types of schools and socio-economic areas, from grades 4 to 12, and from children's spoken language.

(c) The measurement of social status

The Congalton-Havighurst scale[65] was the first and most comprehensive socio-economic scale developed in New Zealand. It was based on ratings of occupation, house residential area and house type with weightings of five, four and three for each rating respectively.

Occupations were ranked on their social status position; homes according to their vintage, size, and position. The authors found the occupational scale to be the most reliable index of an individual's socio-economic status.

(C) A REVIEW OF LITERATURE RELATED TO THE LINGUISTIC THEORY UNDERLYING THE LINGUISTIC ANALYSES USED IN THE STUDY

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[64] E. Dale and G. Eickholz et al. 1961. Children's Knowledge of Words. An interim report published by the Bureau of Educational Research and Service, The Ohio State University.

[65] A.A. Congalton and R.J. Havighurst. 1954. "Status Ranking of Occupations in New Zealand". Australian Journal of Psychology, Vol. 6, 1954, pp. 10-15.

(a) Various grammar systems

The analysis of the language data obtained in this study was based on generative grammar theories.

The traditional grammar system could not be considered because of its rigidly prescriptive standards of usage.

Many sentences in transcriptions of classroom discourse would be classified as ungrammatical, as had been found by researchers attempting to analyse tape-scripts for linguistic structure.[66]

Although the structural and constituent linguistics' descriptive methods provided useful forms of linguistic analyses the descriptions were of the surface structure only of the spoken utterance.

Wales and Marshall[67] claimed that the employment of constituent analysis was justifiable only when the theoretical basis was founded in associationism.

In Finite-Structure Grammar ad hoc formulas were needed for description of the sequences of constituents. Chomsky[68] had shown that such complex methods lost the ability to describe adequately the structure and intuitive relations within the utterance.

Harris'[69] "String Analysis" was more general than

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[66] Biddle and Loflin. Op.cit.

[67] R.J. Wales and J.C. Marshall. 1966. "Linguistic Performance". Psycholinguistics. Report on the Edinburgh Conference, p. 47 ff.

[68] N. Chomsky. 1956. "Three Models for the Description of Language". I.R.E. Transactions on Information Theory, Vol. II, No. 2, 1956.

[69] Z.S. Harris. 1965. String Analysis of Sentence Structure. Mouton & Co., The Hague.

constituent analysis. The unit of analysis was the sentence; it had as its centre an "elementary sentence" with the possible adjuncts either to left or right of the centre. Each word was assigned to a word category and characterised by a mathematical symbol or formula.

This method allowed for a description of phrase embedding but a co-ordinated structure could not be shown without complex bracketing rules. As with other grammar systems this did not have the power to describe the psychologically complex linguistic structures underlying spoken utterances.

Analysis which used transformation grammar models provided distinction between the language utterances and that which was underlying them. The search in transformation grammar was for the nature of the abstract and complex base structures.

(b) Chomskian transformational grammar

The principal features of Chomskian transformational grammar formed the basis for the analysis of the language data in this study for these reasons:

1. It was considered by linguists to be the most dynamic and influential of all linguistic theories.[70,71]
2. The emphasis was upon the primacy of the spoken over the written word.
3. Linguistic performance was related to an appropriate

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[70] D.A. Reibel and B.A. Schane (editors). 1969. Modern Studies in English: Readings in Transformational Grammar. Prentice-Hall Inc., New Jersey, pp. vii to 1, 35.

[71] R.J. Wales and J.C. Marshall. 1966. Op.cit., pp. 47-54.

model of competence.[72]

4. The central concern was the native speaker's competence and performance.

5. The linguistic theory had applications in the philosophy of language.[73]

6. It could have application in the study of the psychology of language, particularly language in the classroom.

For analyses of language data such as that in this study there were difficulties in using Chomskian theories. They had a high degree of determinism and no provision for all ungrammatical sentences. Some writers, for example Lyons,[74] claim Chomskian linguistic theory was linked to the postulates of a particular psychological school, i.e. rational psychology and upon models of logico-mathematical philosophy.

However, the reasons which would make the use of generative grammar unpropitious as a theoretical basis in research such as this would seem not to have ascendancy over the favourable reasons presented earlier.

i. A summary of Chomsky's linguistic theories to 1973. The basic premise of Chomskian linguistic theory is that human language was creative or open-ended in that:

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[72] J.J. Katz and J.A. Fodor (editors). 1964. The Structure of Language: Readings in the Philosophy of Language. Prentice-Hall Inc., New Jersey, pp. 29-95.

[73] J.J. Katz and J.A. Fodor (editors). 1964. Ibid.

[74] J. Lyons. 1970. "Chomsky". Fontana Modern Masters Series. F. Kermode (editor). Wm. Collins & Co. Ltd., pp. 56-76, 163-4.

1. Most sentences spoken were "new sentences", that is, occurred only once.
2. This remained true irrespective of the number of recorded utterances.
3. Only a small proportion of the indefinitely large number of possible sentences of a language had ever been spoken.
4. A speaker who knew the language had intuitive control of a "grammar" which characterised or "generated" the infinitely possible sentences.

In the generative grammar theory Chomsky accounted for the different types of simple sentence by means of transformation rules.

The simple sentence was known as the "kernel sentence". All other types of simple sentences were accounted for by transformation rules. Each of the rules was presented as a formula which described the results of cognitive processes, and which showed precisely the grammatical relationships within an utterance.

The sentence was the basis of the syntactic system; the lexicon a subcomponent.

In his account of Chomsky's modified theories, Lyons[75] described the addition of a semantic component to the rules so that the system related the semantics of each generated sentence to its physical expression. The difference between types of sentences was described in terms of the choice made in basic transformational

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[75] J. Lyons. 1970. Ibid.

rules.

The meaning of the sentence spoken was produced from the underlying structures. The distinction was made between the logical structure, "deep structure", and the grammatical structure, "surface structure".

Thus the user's control of the language's "grammar" determined the deep structures and imparted them to their related surface structures.

Katz and Fodor[76] and Katz and Postal[77] postulated that the syntactic structure of a sentence as was found in the uttered phrase structure components was radically different from that represented by its underlying structure and was also "far richer" than its underlying structure. These theories are considered to have pertinence for research into classroom communication and into the nature of cognitive processes.[78]

ii. Chomsky's psychological theories. The generative grammar theory's basic assumption is that the nature of a language's syntax was found in the intuition of the native speaker but the theory gave no description of the origin of the processes employed by the speaker. However, Allen and Van Buren[79] and others have suggested that the study of language provides "a remarkably

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[76] J.J. Katz and J.A. Fodor. 1963. "The Structure of Semantic Theory" in Language, No. 39.

[77] J.J. Katz and P.M. Postal. 1964. "An Integrated Theory of Linguistic Descriptions". Massachusetts Institute of Technology Research Monographs, No. 26. Cambridge, Massachusetts.

[78] J.P.B. Allen and P. Van Buren (editors). 1971. "Chomsky: Selected Readings". Language and Language Learning Series. Oxford University Press, London, Chapter 7.

[79] J.P.B. Allen and P. Van Buren (editors). 1971. Ibid.

favourable perspective for the study of human mental processes".

Chomsky did not propose that his theories gave a cognitive-process model because they would have needed to include neurological, physiological, and psychological processes and extra-linguistic factors.

iii. Empirical validation of Chomsky's psychological theories. This has been attempted by George Miller[80] who initiated experimental laboratory investigations into the psychological structures responsible, in part, for linguistic performance. The experiments concerned those language structures which were components of the English mood and voice systems and embedding processes.

Miller's experiments were designed to show how the psychological difficulties of processing deep structures and surface structures were related to the discrepancies between them.

Miller's and others' later, more generally-accepted experiments concerning the generative grammarian's hypotheses on verbal behaviour have been outlined in Miller,[81,84] Lyons[82] and Wales and Marshall.[83]

Miller[84] reported results from a sentence-matching

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[80] In Lyons, 1970, op.cit. and Allen and Van Buren, 1971, op.cit.

[81] G.A. Miller. 1962. "Some Psychological Studies of Grammar". Presidential Address to Eastern Psychological Association. American Psychologist, Vol. 17, No. 11, November 1962.

[82] J. Lyons. 1970. Op.cit.

[83] D.J. Wales and J.C. Marshall. 1966. Op.cit.

[84] G.A. Miller. 1962. Op.cit.

task involving comparisons between sentences in which there were transformational relations - that is, the simple sentence in active voice to passive, negative; interrogative to passive negative; passive interrogative and negative interrogative to passive negative interrogative. Miller, and later Marshall,[85] found relationships between the performance time on the tasks and the number of transformations involved in the relation between the sentences concerned.

They had attempted to measure transformational complexity in psychological terms as the variable increase in processing time over a constant base.

The findings having shown statistically significant relationships between performance times and the number of transforms involved in processing of the various components, both voice and mood systems, gave general support to the hypothesis. Similar research results were obtained between embedded sentences derived from single as compared with two or more kernel sentences.

Since these reports there have been revisions of transformational theory, particularly in the passive transform rules and in the operation of generalisation in the semantic component, and to a limited extent on the nature of the kernel sentence.

However, Wales and Marshall claimed that despite changes "all the previous results stand".[86]

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[85] J.C. Marshall. 1966. "Behavioural Concomitants of Linguistic Complexity" in Wales and Marshall, op.cit.

[86] R.J. Wales and J.C. Marshall. 1966. Op.cit., p. 50.

Recent reports of research in this field of behaviour referred to Miller's proposition that an important variable for exploration would be syntactic structure in sentences. Some journal articles concerning psycholinguistic research have reported experiments on syntax. The results of those experiments reveal conflicting results and interpretations. For example, Paivio[87] compared rated imagery and deep-structure complexity as predictors of the free recall of English nominalisations. He found no positive effect from deep-structure complexity. However, Bacharach and Kellos[88] in comparing base structure effects on retention found that, while there was no effect from base structure, there were slower response times for passive sentences.

Cutting across these experimental reports were findings related to other dimensions of verbal behaviour. Wearing[89] found that predictability and surface structure interacted. He suggested that there was a strong influence from semantic variables within the syntactic structures.

These findings are indicative of the major problem

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[87] A. Paivio. 1971. "Imagery and Deep Structure in the Recall of English Nominalisations". Journal of Verbal Learning and Verbal Behaviour, Vol. 10, No. 1, February 1971, pp. 1-12.

[88] V.P. Bacharach and G. Kellos. 1971. "Phrase Versus Base Structure Effects on Short-term Retention". Journal of Verbal Learning and Verbal Behaviour, Vol. 10, No. 2, April 1971, pp. 171-172.

[89] A.J. Wearing. 1970. "The Storage of Complex Sentences". Journal of Verbal Learning and Verbal Behaviour, Vol. 9, No. 1, pp. 21-29.

in this area of psycholinguistic research: the variability of semantic and other properties in test materials may not have been given sufficient attention. Another problem stems from the recall methods used in experiments; perhaps the tests were examining the validity of memory theories as much as, if not more than, psycholinguistic hypotheses. Furthermore, research into syntactic complexity as a determiner of comprehensibility has used correlational analysis for the measurement of concomitant variability. However, one of the basic assumptions of generative grammar theories was that the number of spoken utterances which could be frozen for use as test items was infinite. If so, the interpretations of the reported test results must be tentative.

The major problem in psycholinguistic research has been that the focus was on a few variables in data which are multi-dimensional in nature for even the most simple verbal forms.

Because the generative grammar theories are lacking in strong experimental verification they must be considered as tentative. Nevertheless, they are still regarded, on logical grounds, as the most powerful and influential theories. It is upon their premises that this study depends for its theoretical foundation and its selected procedures.

iv. <u>The Chomskian theory of phrase nesting constructions</u>. There have been various explanations made for language learning. The behaviourists' theory of

the development and usage of natural language is based on the acquisition, through experience, of the combination of basic verbal or behavioural events.

Non-behaviourist psycholinguists, Chomsky, Miller, and others, argue that sentences are learned through the acquisition of the basic syntactic rules of the grammar which are used to generate those strings of words known as sentences.[90] Chomsky[91] argued that while there are an infinite number of different grammatical sentences there are recursive operations related to the finite number of elements and rules of the grammar. These recursive operations formed right-branching, left-branching and embedded sentences.

In the right-branching sentence the phrase structures are preceded by the principal clause, vice versa for the left-branching; and in self-embedded the subordinate structure is inserted usually between the subject and the predicate of a sentence. The psycho-linguists of the Chomskian school considered that it is intuitively obvious that the self-embedded operation makes the greatest psychological demand on the hearer. They also consider that the left-branching sentence makes demands upon the hearer's ability to retain unrelated structures. For example, Miller and Isard[92] found that the degree of self-embedding made significant

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[90] G.A. Miller. 1970. Psychology of Communications: Seven Essays. Pelican Book Series, Penguin Books, England.

[91] In G.A. Miller. 1970. Op.cit., pp. 74-94.

[92] G.A. Miller and S. Isard. 1964. "Some Perceptual Consequences of Linguistic Rules". Journal of Verbal Learning and Verbal Behaviour, Vol. 2, 1964, pp. 217-228.

differences to their subjects' ability to memorise sentences.

(c) The theories and teaching research

The essence of the enquiry in this study was a search for means of describing, from empirical research on teaching, those teaching behaviours which influence pupil achievement, in particular the nature or characteristics of teacher language.

In order to give order and direction, the investigation into linguistic structure of teacher talk had to be founded upon a linguistic theory which firstly could be accepted with conviction, was reputable, and which had been in some degree empirically validated.

Intuitive judgment of what constitutes the significant language variables in teacher behaviours in relation to their effect, the theories previously outlined above, the general acceptance, and validation (although limited), were the a priori grounds for the theories outlined being the corner-stone of the linguistic research in this study.

The employment by the teacher of differing lexical and syntactic structures makes for a variation in the cognitive depth and demands in classroom discourse. It was considered that these could yield useful scientific research findings.

The chapter following includes outlines of the procedures used which developed from considerations of the linguistic theory.

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CHAPTER III

THE DESIGN OF THE STUDY

The purpose of this exploratory investigation was the examination of selected teacher and pupil behaviours, particularly language variables employed in classroom verbal interaction.

To achieve this the procedures outlined in the following pages were employed.

A Social Studies topic was prepared; basic outlines and materials were presented to teachers in the sample; and a programme of testing and recording of lessons was followed.

Test instruments were constructed to determine prior knowledge, attitude, and attainment. A test of associative reasoning gave a measure of pupil verbal ability.

Some teaching behaviours, other teacher differences, and pupil differences were selected to obtain data for investigation.

In this chapter these independent variables are described and the methods employed to obtain them are detailed.

(A) PROCEDURES

(a) The preparatory period

A Social Studies topic - Farming in the Northland region of New Zealand - was chosen which would provide opportunity for full verbal interaction during lessons.

The choice of the most northerly farming area of New Zealand reduced the possibility of children from a South Island urban community having prior experience of this distinctively different rural area.

Outlines of a three-lesson sequence were prepared with the help of a leading Social Studies teacher who was at the time Chairman of a committee assisting in the re-planning of the Social Studies curriculum in New Zealand.

The lesson topics dealt with: the problems farmers faced in farming that area; land, relief, climate, vegetation, soil, land use problems, and means of development.

A pupil booklet was prepared (see Appendix 2, page 195). Pertinent illustrations were made by printing enlarged frames from the film strip "Farming in North-land" produced by the New Zealand National Film Library for use in schools.

Wall charts were made which were coloured sketches enlarging most of the frames in the pupil booklet with brief captions added (see Appendix 5, page 226).

An extract from a volume on regional geography was prepared (see Appendix 3, page 201) as resource notes for the teachers.

After interviews with the education authorities and with suggestions from them of which schools would provide a socio-economic cross-section of the Christ-church region, letters were sent to the headmasters of a sample of Primary and Secondary co-educational state schools. This letter contained an outline of the aims

and past development of the Teaching Research Project of the University of Canterbury, a resumé of the research proposed, and a request for an interview.

All but one of the headmasters agreed to the research being conducted in their schools.

During the second visit to each school the teachers willing to take part in the research met with the investigator. Each teacher was presented with a cyclostyled explanation of the purposes of the study and the programme (see Appendix 4, page 220). Any further preliminary problems were discussed by telephone with the teachers.

Before the research exercise began in each school the teacher was sent an explanation of the details of the programme and procedures, a sample of the pupil booklets, a summary of the sequence of topics and a copy of the resource information.

The day prior to the exercise in each classroom the equipment needed for recording was mounted in the room (with the exception of two classrooms in which it was necessary to do the preparation on the same day).

Two stereophonic tape-recorders with four microphones were used.

(b) The programme

The recording of each group of three lessons and the administration of all tests (except the post-test) were conducted in a one-week period:

Day One - (a) Administration by the classroom teacher of the Pre-Test - 15 minutes.

(b) Introductory lesson - 20 minutes, recorded.

Day Two - Second lesson recorded.

Day Three - Third lesson recorded.

Day Four - Administration by the experimenter of Attitude Questionnaire and the Children's Associative Reasoning Test.

Day Five - (one week after Day Four) Administration of Post-Test by the experimenter.

The programme for secondary school classes was conducted during the middle and latter part of the first half-year; for the primary classes in the middle and latter part of the second half-year.

(c) Methods of recording and transcribing

Each teacher in the sample taught his own class for the series of lessons in the experiment. The teacher was free to treat the lessons as he wished within the constraints of the topic content and sequence as they are described in Appendix 5 on page 226.

All that took place during the three lessons was recorded. The experimenter sat at the back of each classroom and was able, by use of numbered seating plans, to record the names of pupils who participated.

The taped lessons were: transcribed by a typist; checked and corrected by the experimenter with both recordings; the corrections retyped; a final check made by the experimenter.

Having two two-track recordings enabled all but a small number of utterances to be recorded and thus trans-

cribed.

An example of a tapescript is given in Appendix 6 on page 231.

(B) RESEARCH SAMPLES

(a) The schools

A cross-section of the socio-economic strata in the Christchurch urban areas was represented in the schools who contributed to the study. The sample consisted of 8 classes in 4 co-educational state secondary schools and 6 classes in 4 co-educational intermediate schools.

The secondary school classes (Form III) were from the upper streams or academic-course groups. However, in all classes there was a wide spread of abilities from average to high as indicated by intelligence test results. Intermediate school classes (Form II) consisted of upper level classes with a spread of ability in each class.

The number of Form III pupils was 267, the number of Form II pupils was 203, making a total of 470 pupils in the sample.

(b) The teachers

The teacher sample is described in Table I. Those in the secondary teacher sample were all university graduates in history and/or geography. Two primary teachers had university degrees, but only one had any qualifications in history or geography. One primary teacher, a university graduate, had spent her previous first teaching year in a secondary school. All the

TABLE I

Analysis of Teacher Sample

	Male	Female	TOTAL
Primary:			
experienced	2	-	2
inexperienced	1	3	4
Secondary:			
experienced	2	-	2
inexperienced	3	3	6
	8	6	14

Note: "experienced" teachers had taught for more than one year.

others had received their professional education in primary courses at teachers' colleges.

(C) THE INSTRUMENTS USED

(a) The pre-test - an independent variable (see Appendix 7, page 236)

A multiple-choice test was constructed to test prior knowledge of the topics and concepts contained in the lesson content. A preliminary trial form of the test was administered to two middle ability Form III classes and the results analysed (see Table II below).

Because the subjects used for the trial form were from two middle stream classes with intelligence quotients within the normal range the indices of difficulty and discrimination were supplemented with expert judgments from teachers.

TABLE II

Item Analysis Statistics on Preliminary Form of Northland Pre-test, as determined from proportions of correct responses in upper and lower thirds of the group

Item	Difficulty Index	Discrimination Index	Decision	No. of answer stems modified
3	.84	.21	Modified	1
4	.21	.39	Retained	-
5	.18	.15	Retained	-
6	.51	.39	Modified	1
7	.25	.12	Retained	-
8	.46	.48	Retained	-
9	.76	.24	Modified	1
10	.28	.30	Retained	-
11	.21	.39	Retained	-
12	.58	.12	Modified	1
13	.10	.18	Modified	1
14	.54	.09	Modified	1
15	.18	.27	Retained	-
16	.27	.21	Retained	-
17	.43	.24	Modified	1
18	.18	.33	Retained	-
19	.33	.15	Retained	-
20	.49	.18	Modified	4
21	.42	.27	Modified	1
22	.37	.48	Discarded and replaced	-

N = 67

(b) The post-test

An objective 30-item multiple-choice test was constructed to measure pupil achievement (see Appendix 8, page 246). The items were selected so that they represented the specific objectives of the lessons and tested the concepts and major details contained in the lesson prescriptions and pupil booklet and charts.

No time limit was imposed upon the test.

A trial form of the test was administered to a

non-participant class and only slight modification proved necessary.

(c) The Children's Associative Reasoning Test - an independent variable

The original form of the CART was adapted to suit New Zealand conditions by discarding items not within common usage. Eight items were discarded and three modified. The amended final form of the test contained 67 of the 75 items in the original standardised test (see Appendix 9, page 260).

(d) The attitude questionnaire

An attitude questionnaire was constructed to obtain relevant information on each pupil's prior experience, background, socio-economic status, access to lesson-relevant information, and attitudes to the subject, method and to school in general (see Appendix 10, page 270).

A summary of the attitude questionnaire

Questions	Purpose
1, 6	Prior experience of lesson material.
2	Socio-economic status.
3, 5, 7	Availability and use of relevant reading and sources of information on Northland.
4, 8-20	Pupil judgments on lessons in general, Social Studies lesson, the experimental lessons, and the treatments and method employed.

(D) THE INDEPENDENT VARIABLES

The independent variables consisted of 97 teacher variables and 67 pupil variables.

(a) The teacher variables

The teacher variables consisted of questions, episodes and monologues, and other variables in the teachers' classroom language: the lexicon, the structure and style employed, the use of vagueness and of the scientific-emotive dimension of language.

i. Questions, episodes and monologues. The coding scheme employed was adapted from The Canterbury Coding Scheme.[1]

Units of analysis

a. Primary Questions

A 'question' was defined as any utterance which called for a pupil response. This included the grammatical question, interrogative statements, requests, directives and demands that called for a pupil response.

A Primary Question was a question which elicited a new or a different response, that is, a response other than that which would have been appropriate to the preceding question.

b. Secondary Questions

A Secondary Question was a repeated, continuing, or subsidiary question which called for a response which would have been appropriate as an answer or partial answer to the immediately preceding primary question.

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[1] Coding Manual: The Teaching Research Project, The Department of Education, University of Canterbury. (Mimeographed material.)

c. An Episode consisted of a sequence of discourse initiated by a Primary Question, all responses to it, and the appropriate Secondary Questions and responses.

d. Monologues

In this study a Monologue was any statement of five or more lines of transcript irrespective of where it occurred. Thus a Monologue could have been interposed between two parts of an Episode. A rhetorical question was coded as a Monologue if it was the requisite length.

Classification of units

a. The Primary Questions were classified into the following major categories:

1. Defining
2. Describing
3. Procedural Description
4. Giving examples
5. Naming
6. Stating
7. Exercises
8. Reporting General
9. Personal Reporting
10. Evaluating
11. Opining
12. Classifying
13. Comparing and Contrasting
14. Conditional Inferring
15. Explaining.

The questions were also grouped into broader sets on an a priori basis as follows:

16. Group 1 - Describing questions
    from Question types 1-6
17. Group 2 - Exercising questions
    from Question types 7-10
18. Group 3 - Reasoning questions
    from Question types 11-15.

b. Secondary Questions

These were not classified nor used in this study.

c. Episodes

Classification of episodes in the verbal interaction was in terms of relevance of content to the prescribed topics. Seven types of episodes were identified:

19. Content Episode (CE): content directly relevant to the prescribed lesson content.
20. Analogous Digression (AD): an episode constituted of analogous material which was related to the topic (either explicitly or implicitly) within the same or another episode.
21. Incidental Digression (ID): the content was not relevant to the topic but was followed by a verbal move which redirected the discourse to the topic or directly related material.
22. Negative Analogous Digression (ADneg): An episode constituted of analogous material which was not explicitly or implicitly applied to the topic.
23. Tangential Digression (TD): A number of

verbal moves in which the discourse digressed from the prescribed content to either:

(i) irrelevant, non-analogous material, or

(ii) although analogous, came within the centre of focus and was not used illustratively. These analogies generated often more irrelevant material, or

(iii) an episode in which incorrect information was presented or accepted.

24. Procedural Digression (PD): Episodes which were devoted to questions on lesson procedure and in which there was no reference to content.

25. Managerial Digression (MD): An episode initiated by a question or statement concerning class management or control.

Two further variables were used which were:

26. Questions per hour: primary questions only, indicative of episodes per hour.

Episode length: determined by lines of transcript.

27. Class 1 Episodes = 1 - 10 lines

28. Class 2 Episodes = 11 - 20 lines

29. Class 3 Episodes = 21 - 30 lines

30. Class 4 Episodes = 31 - 40 lines

31. Class 5 Episodes = 41 or more lines

d. Monologues

A Monologue was defined for the purposes of this research as teacher talk of at least 5 lines of tape

transcript which were not included as part of an episode. A teacher question or series of questions which had more than 4 transcript lines was treated as part of an episode. However, rhetorical questions which were not treated or accepted as primary questions were classified as Monologues when of at least 5 transcript lines.

Design

Teacher monologues were classified in terms of their pedagogical purpose:

32. Summary Monologue (S): A summation of material from previous episodes.
33. Introductory Monologue (I): A teacher statement which was introductory to a new topic.
34. Expository Monologue (E): A teacher statement which provided an explanation, description or commentary upon the content of episodes.

Type

Teacher Monologues classified in terms of relevance to prescribed content:

35. Overtures (O): Monologues containing thought-orientating, precursory verbal moves in which the subject of the discourse was pertinent to the prescribed lesson topics but was not directly content material.

The remaining Monologue types were classified in the same way as Episodes:

36. Content (C)

37. Incidental (I)

38. Analogous (A)

39. Negative Analogous Monologues (Aneg)

40. Tangential (T)

41. Procedural and Managerial (PM)

Monologue length and frequency

42. Low: 5-20 lines of transcript.

43. High: More than 20 lines of transcript.

44. Monologues per hour.

Methods used to obtain the raw teacher data

The sample for linguistic analysis: From the typewritten transcriptions of the recorded lessons 200 transcript lines of teacher monologue were selected as the sample; 100 lines were taken from the middle of each of the second and third lessons. Because the number and extent of monologues varied between teachers, each 100 line section extended in differing ranges across each lesson.

For one teacher in the sample most of the monologues in the lesson had to be used to accumulate the necessary line number. However, it was not necessary to go outside the last two lessons in the others nor to overlap from lesson two to three.

A 'line' of transcript was defined for research purposes as a sequence of at least 4 words.

ii. Lexicon, structure, and style in teacher language.

a. The lexicon

A count was made of the total number of nouns,

adjectives, adverbs, and verbs in the teacher monologue samples (omitting "have", "be", "go", "went", which were considered to be words generally and loosely used at all levels). The words were then placed in the following categories from the Dale and Eickholz list:[2]

45. Number of words below Grade 4 vocabulary.

46. Number of words in Grade 4 vocabulary.

47. Number of words in Grade 6 vocabulary.

48. Number of words in Grade 8 vocabulary.

49. Number of words in Grade 10 vocabulary.

50. Number of words in Grade 12 vocabulary.

51. Not classifiable - technical vocabulary.

b. Morphemic structure and phrase subordination

Morphemes per group - the number of words (lexical units, including all utterance units) in each "clause". A "clause" in this study was any utterance which had structural unity, and was grammatically independent but did not necessarily contain semantic strength because of ambiguity or because it was non-interpretable.

52. High: 14 or more morphemes per group.

53. Moderate: 8 to 13 morphemes per group.

54. Low: 1 to 7 morphemes per group.

Phrase subordination - the "traditional grammar" method of analysis was employed to determine the nature of phrase and clause dependence. The classification employed was only for purposes of discriminating between sentences and was not regarded as having taxonomical

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[2]Dale and Eickholz et al. 1961. Op.cit.

significance.

55. Frequency of simple sentences (1) - no additional dependent structure.
56. Frequency of simple sentences (2) - one dependent structure.
57. Frequency of simple sentences (3) - two or more dependent structures.
58. Frequency of multiple (co-ordinate) sentences (4) - no dependent structures.
59. Frequency of multiple (co-ordinate) sentences (5) - one or two dependent structures.
60. Frequency of multiple (co-ordinate) sentences (6) - three or more dependent structures.
61. Frequency of complex sentences (7) - one subordinate structure.
62. Frequency of complex sentences (8) - two subordinate structures.
63. Frequency of complex sentences (9) - three or more subordinate structures.
64. Frequency of compound-complex sentences (10) - multiple with complex - no subordinate structures.
65. Frequency of compound-complex sentences (11) - with one or two subordinate structures.
66. Frequency of compound-complex sentences (12) - with three or more subordinate structures.

c. Voice and negation

67. Frequency of sentences in which the active voice was employed.

68. Frequency of sentences in which the passive voice was employed.

69. Negation - the number of negative words, words negated by suffix, prefix, diminutives which negate sentence meaning.

d. Phrase structure

The phrase structures formed from recursive grammatical operations as described in Chapter II, page 47, were selected to obtain one indication of the "psychological demands" of the linguistic structure of teacher language. One other recursive operation was found to be commonly used by the teachers: a combination of the "left-branching" and the "right-branching" sentences. The principal clause was both preceded and followed by subordinate phrase structures. This was categorised as an "enclosed structure" and included in the selected independent variables.

It was hypothesized that these "enclosed" phrase structures make psychological demands upon the hearer more than the "right-branching" phrase structures and simple sentences do.

70. Embedded sentence structure.

71. Left-branching structure.

72. Enclosed structure.

73. Right-branching structure.

74. Simple sentence.

e. Style - style indices:

In Chapter II, page 32 ff, the various "characteristics" of the style in spoken English were extracted

from prominent investigations and selected for independent variables in the analyses of teacher language.

75. Use of first and second person pronouns.
76. Use of third person pronouns.
77. Use of split infinitives as a percentage of all pronouns.
78. Number disagreement.
79. Repetitions - the repetition of word or phrase.
80. Renewal - words or phrases which were restructured.
81. Stabilisers - words or idiomatic expressions used to reinforce the correctness of a statement or to substantiate one.
82. Hesitations - half words, vocalised pauses.
83. Initial markers - expressions such as "well", "so", "now", initiating a statement.
84. Anacoluthon - unusual or incorrect grammatical sequence but not necessarily for poetic or rhetorical purposes.
85. Phatic communion - a social expression of one or a few words with diluted meaning and employing syntactic ellipsis. Meaningless to other than participants.
86. Prosiopesis - a meaningful expression but with the abbreviation of a sentence by beginning mid-sentence usually by omitting the subject.
87. Object deletion - abbreviation by omitting

the conclusion of a sentence but which was nevertheless a meaningful expression.

88. Extraction - an abbreviation in which the message of the sentence was conveyed in one word; meaningless out of context.
89. General abbreviation - sentence or word partial; semi-meaningful outside context.
90. Ellipsis - an abbreviation by methods other than those in variables 85-89. Meaningful expression.
91. Slang - colloquial, non-standard expressions including trite adult jargon.
92. Jargon - colloquial expressions belonging to a particular social group particularly teenage expressions.

Phrasals

A phrasal, a group of words of high frequency used in place of a single word which would have given more precise meaning. Phrasals are, in essence, forms of vague expressions.

93. Phrasal verbs - a verb of high frequency occurrence with a prepositional or postpositional adverb, for example, "find out".
94. Phrasal nouns - a trite expression, a phrase composed of high frequency words, for example, "such and such", "this certain thing".
95. Phrasal adjectives and adverbs - groups of words performing a qualifying or modifying function and having indefinite qualification, for example,"sort of","more or less".

f. Vagueness

96. Vagueness - expression as listed in Hiller's dictionary of vague expressions but without qualifying them in sub-categories.

g. Scientific-emotive dimension

97. Scientific-emotive dimension - a broad category: any expression which added a distinctive emotional component to reinforce the statement. Measured by the number of lines of tapescript containing the emotive expression.

(b) The pupil variables

The rationale for the choice of these variables has been provided in Chapter II. Descriptions of the variables and the methods used to obtain raw scores are provided in this section.

1. Social status rating. The occupational scale only of the Congalton-Havighurst scale was used for measurement; the other sections of the original study are not of contemporary significance. The median rating measures of the scale were used. It was possible with a scale as comprehensive as the Congalton-Havighurst to obtain measurements for almost all the pupil sample.
2. A Post-test score (a dependent variable) - a raw score with a maximum of 30.
3. A Pre-test score - a raw score with a maximum of 20.
4. Children's Associative Reasoning Test score - the score of correct answers was used with a maximum

score of 67.

5. Intelligence quotient - the school records were used to obtain these. All but a few were ACER test quotients; the remainder were OTIS Intermediate or Higher scores.

6. Participation in lessons - the number of verbal moves the pupil initiated or responded to.

7. Number of lessons during which the pupil was present - a score out of 3.

8. Children's Associative Reasoning Test foil score.

9-67. Scores from the Attitude Questionnaire:

9. Areas of domicile. The ratings assigned were:

    0 - urban domiciliation
    1 - rural domiciliation
    2 - Northland domiciliation

10. Northland visits were rated as follows:

    0 - never visited
    1 - visit of less than a week
    2 - visit of a week or more

11-31. Resource Material. Scored when used for reference and for each source of availability.

11. Use of encyclopedias for reference (homework) or general interest.

12. School encyclopedias used.

13. Encyclopedias from home or some other readily accessible course.

14-16. National Geographic.

17-19. Books on New Zealand.

20-22. The Student's Digest.

23-25. The Weekly News.

26-28. The Journal of Agriculture.

29-31. Any other volume which could have information pertinent to farming or the Northland region.

32-67. Pupils' Judgments, Attitudes and Opinions

The ratings are shown in the parentheses.

32. The immediate benefit of Social Studies (1-5).

33. Benefit of Social Studies after schooling (1-5).

34-38. Pupils' favourite source of information for Social Studies (0 : negative; 1 : positive)

39. Previous lessons on Northland (1-3).

40. Amount read on Northland since experimental lessons had begun (1-4).

41. Opinion of how much was learned from the lessons (1-4).

42. Interest level of the experimental lessons (1-5).

43. Level of interest of Social Studies usually (1-4).

44. Level of difficulty of Northland lessons (1-4).

45. Level of difficulty of usual Social Studies lessons (1-4).

46. The lessons' level of difficulty to understand (1-4).

47. Amount of questioning in the Northland lessons compared with the usual Social Studies lessons (3-1).

48. Extent of expression of opinions or ideas by the class (3-1).

49. Comparison of the amount of argument or discussion during lessons (3-1).

50-55. Amount of question answering usually in these subjects (each rated 1-5).

50. English.

51. Science.

52. Social Studies.

53. Music.

54. Mathematics.

55. Art.

56-61. Amount of argument or discussion in each subject in the order above (each rated 1-5).

62-67. Ranking of school subjects as above in their order of favouritism. Each was assigned the measure according to the pupil ranking.

* * *

CHAPTER IV

THE RESULTS OF THE STUDY

In the previous chapter the independent variables were described and the procedures employed in the study were outlined.

This chapter presents the results of the study and details the methods used for the collection of the raw data. This data is given in tables, accompanied by notes on the calculations, and notes on the contents of each table.

(A) THE TEACHER VARIABLES

For all the teacher variables scores were obtained for:

i. each teacher,

ii. the full teacher sample,

iii. the teachers by class grades.

Questions, Episodes and Monologues

(a) Questions

i. Types of questions. The frequency of each of the 15 types of questions was calculated as a percentage of the full number of questions used by each teacher.

Types of Primary Questions: Teacher variables 1-15.

These are shown in Table III below.

"Defining" Questions: Teacher variable 1.

The average percentage score for all teachers and teachers by grades was approximately 4%. The range of scores for Form III and Form II teachers was 1% to 9%

TABLE III

Percentage of Types of Teacher Questions in all Tapescripts

Teacher	Question Types - Percentages														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
701	6.99	37.06	2.10	0.70	30.07	0.70	1.40	0	0	2.10	0	0	4.90	0	13.99
702	0.62	33.33	3.7	0	33.33	0	0	0	0	2.47	0.62	0.62	3.70	4.32	17.28
703	3.80	48.91	10.87	0	18.48	0	0	0	0.54	3.26	1.09	0.54	2.72	2.17	7.61
704	9.27	29.14	10.60	1.32	27.15	0	0	0	0	0	1.32	1.32	2.65	3.97	13.25
705	1.32	46.05	5.92	0	17.76	0	1.97	0	0	11.18	0.66	0	3.95	0.66	10.53
706	2.27	40.15	15.91	0.76	12.12	0	0	1.52	1.52	6.06	0	2.27	3.79	1.52	12.12
707	2.70	25.00	8.11	0	29.73	0	0	0	0	4.73	2.70	0	0.68	5.41	21.62
708	5.56	30.25	12.96	1.23	34.57	0	0	0	0	0.62	0.62	0	2.47	6.79	4.94
609	4.97	27.62	9.94	0	25.41	0	0.55	3.87	3.31	4.97	1.10	0	2.76	2.21	13.26
610	8.33	33.33	6.25	1.04	34.38	0	0	3.13	2.08	4.17	0	0	0	1.04	6.25
611	2.21	33.15	19.34	0	17.68	0.55	0	2.76	0	3.87	2.21	0.55	0.55	4.97	12.15
612	6.12	32.14	3.06	0.51	34.69	0	0	0	0	0	1.53	4.08	5.61	0.51	11.73
613	5.78	34.10	11.56	0	26.01	1.73	3.47	3.47	1.16	4.62	0	0	1.16	1.16	5.78
614	1.20	31.33	3.61	0	30.72	0.60	2.41	2.41	0	3.61	0.60	0	2.41	4.82	16.27
All Teachers															
$\bar{X}$	4.37	34.40	8.85	0.40	26.58	0.26	0.70	1.23	0.62	3.68	0.88	0.67	2.67	2.83	11.90
By Forms:															
III $\bar{X}$	4.07	36.24	8.77	0.50	25.40	0.09	0.42	0.19	0.26	3.80	0.88	0.59	3.11	3.11	12.67
II $\bar{X}$	4.77	31.94	8.96	0.26	28.15	0.48	1.07	2.61	1.09	3.54	0.91	0.77	2.08	2.45	10.91

Note: In all tables the digit of the teacher number indicates the grade of the class. Grade II = Form II, Grade III = Form III (first year secondary school).

approximately.

"Describing" Questions: Teacher variable 2.

This was the most frequently used type of question for all teachers, and for teachers by grades. For the teachers individually this type of question was the most common except for five teachers who had equal or greater scores for "Naming" Questions.

The average score for all teachers was 34%. For Form III teachers the average score was 36% with a range of 30% to 49% but for Form II teachers the average score was 32% with a range of 28% to 34%.

"Procedural Description" Questions: Teacher variable 3.

These made up 9% of questions for all teachers, and for teachers by grades. The range of scores for Form III was 2% to 13%, for Form II teachers 3% to 20%.

Question types 4 "Giving Examples", 6 "Stating", 7 "Exercises", 8 "Reporting General", and 9 "Personal Reporting":

Teacher variables 4, 6 to 9.

For these types of questions the majority of teachers had zero scores and most average scores were less than 1%.

"Naming Questions: Teacher variable 5.

These made up 27% of questions for all teachers, 25% of questions for Form III teachers and 28% for Form II teachers. The ranges of scores for both groups of teachers were also similar.

"Evaluating" Questions: Teacher variable 10.

There was an average score of 4% for all teachers and also for each group of teachers. However, the

range for Form III teachers was zero to 11% but for Form II the range was zero to 5%.

"Opining" and "Classifying" Questions: Teacher variables 11 and 12.

As with question types numbers 4 and 6 to 9, the majority of teachers had zero scores for these two types of questions. The average scores were all below 1%.

"Comparing and Contrasting" and "Conditional Inferring" Questions: Teacher variables 13 and 14.

The average scores for all teachers and for teachers by grades were approximately 3%. The ranges of scores were similar for both groups of teachers.

"Explaining" Questions: Teacher variable 15.

This type of question constituted 11% of questions for all teachers with ranges of 8% to 22% for Form III teachers and 6% to 16% for Form II teachers.

Questions Classified into Three Groups: Teacher variables 16-18.

The scores for these are shown in Table IV below.

"Descriptions": Teacher variable 16.

The score was obtained from the sums of the frequency counts of the first six question types in the 15-type question classification.

The percentage scores in Table IV below indicate that 75% of questions for all teachers and teachers by grades called for "descriptions" in pupil answers. The range of scores for each group of teachers was also similar.

"Operations": Teacher variable 17.

The scores were calculated from question types

TABLE IV

Percentage Scores for all Teacher Question Types in Groups

Teacher	GROUPS A Types 1-6 "Descriptions"	B Types 7-10 "Operations"	C Types 11-15 "Reasons"
701	77.6	3.5	18.9
702	70.9	2.5	26.5
703	82.2	3.8	14.1
704	77.5	0	22.4
705	71.6	13.2	15.8
706	71.2	9.1	19.7
707	65.1	4.7	30.4
708	84.8	0.5	14.7
609	68.3	12.8	19.4
610	83.3	9.4	7.3
611	72.9	6.7	20.6
612	76.5	0	23.5
613	79.2	12.8	8.2
614	67.4	8.4	24.1
All teachers $\bar{X}$	74.89	6.24	18.97
By Forms: III $\bar{X}$	75.12	4.66	20.31
II $\bar{X}$	74.60	8.35	17.18

7-10. For all teachers the average scores and average scores for teachers by grades was from 6% to 8%. The range of scores for each group of teachers was 0-13%.

"Reasoning": Teacher variable 18.

The scores were calculated from question types 11-15.

The average score for all teachers was 19%. There was no apparent difference in average scores between the two teacher groups but the ranges differed: 14% to 30% for Form III teachers and 7% to 24% for Form II teachers.

ii. Questions per hour: Teacher variable 26. Each teacher's percentage score was divided by the total time taken for the three lessons as transcribed. These scores are presented in Table V.

TABLE V

Primary Questions per hour

Teacher	
701	85.798
702	101.250
703	116.213
704	99.558
705	98.065
706	100.251
707	99.778
708	118.534
609	146.761
610	65.453
611	181.000
612	145.185
613	192.222
614	95.771

Analysis:

By Grades		Male	Female	Total
III $\sum$ = 819.446	experienced	106.999	-	106.999
$\bar{X}$ = 102.431	inexperienced	101.120	99.432	100.276
II $\sum$ = 826.392	experienced	168.171	-	168.171
$\bar{X}$ = 137.732	inexperienced	95.771	130.323	121.685
	Totals:	118.684	114.878	117.560

All teachers		All teachers by experience	$\bar{X}$
$\sum$	1645.838	Experienced:	137.585
$\bar{X}$	117.560	Inexperienced:	108.840

The range of scores for all teachers of 65.5 - 192.2 Q.P.H. had its outer limits in the scores of the primary teachers whereas the range for the secondary

teachers was 85.8 - 118.5 Q.P.H.

Experienced teachers in both groups had the higher mean scores with a wider range between the inexperienced and experienced primary teachers' mean scores (95.8 - 168.2 Q.P.H.) than between the two groups of secondary teachers' mean scores (101.1 - 107 Q.P.H.). The average score for Form III teachers was 102; that for Form II teachers was 138.

iii. The use of questions: summary of results and general notes. Of the fifteen types of questions, "describing" questions were the most frequently used by all teachers. That is, over one-third of the teacher questions called for descriptive statements from the pupils. The Form III teachers' scores had a wider range than those of the Form II teachers ("primary" teachers).

The next most frequently used type of question was the "naming" question which showed a score of about 25% of all teacher questions.

Fourth in rank order of scores were "procedural description" questions; fifth in rank order were "defining" questions.

These five types of questions and questions calling for examples made up the first six types of questions in the 15-type question classification. When grouped into one set ("describing questions") there was no significant difference between the scores of primary and secondary teachers. It was shown that 75% of all teacher questions in these experimental lessons called

for descriptions from the pupils. Although the topic in these Social Studies lessons was a study of one land region the outline of lessons presented scope for enquiry into man's use of the area and man-land interaction.

However, only 12% of all teacher questions called for explanations, about 3% for comparisons and contrasts, and about 3% for conditional inferences. When these three types of questions were grouped into a set termed "reasoning" questions the score was 19% for all teachers. The secondary teachers had higher scores on the use of this type of question.

It is possible that one explanation lies in the earlier movement toward "New Social Studies" in the secondary schools of New Zealand with a trend toward the employment of enquiry methods. It could also be suggested that the academic experience of these teachers had an influence on their classroom lesson behaviours.

For those types of questions grouped into what was termed "operations" the scores were low generally. It was found that experienced teachers, irrespective of grades taught, asked more questions than the inexperienced teachers, and also that the primary teachers asked more questions of the pupils than did the secondary teachers.

(b) Episodes

An analysis schedule was devised for operating the mechanics of analysis.

i. Episode relevance: Teacher variables 19-25. Percentage scores were calculated from frequency counts of each type of episode classified in terms of its relevance to the prescribed content. The scores are presented in Table VI.

"Content-relevant" Episodes: Teacher variable 19.

The scores showed that for all teachers and teachers by grades approximately 81% of all episodes were "content-relevant". The range of scores for all teachers on this class of episode, 46% to 89%, had its outer limits in the Form II teachers' scores but for Form III teachers the range was 68% to 89%. There was little difference between the scores of experienced and inexperienced Form III teachers but the experienced Form II teachers' average score was 6% higher than inexperienced teachers in that grade.

"Analogous-digression" Episodes: Teacher variable 20.

For all teachers the average score was 6%. However, Form III teachers had a score of 8% and the Form II teachers 3%. The ranges of scores were 3% to 10% and 1% to 6% for Form III and Form II teachers respectively. There were differences in the scores of experienced and inexperienced teachers; the Form III experienced teachers' average score was 6%, the inexperienced 9%. However, the Form II experienced teachers' average score was higher than that of the Form II inexperienced teachers.

"Incidental Digression Episodes: Teacher variable 21.

For this class of episode the average scores for

TABLE VI

Percentage Scores for Episode Relevance Types in all Tapescripts

Teacher	Episode Types CE	AD	ID	ADneg	TD	PD	MD	PD + MD
701	87.88	9.09	2.27	0	0.76	0	0	0
702	81.66	9.47	0	1.78	2.96	1.78	2.37	4.15
703	88.09	2.98	0.59	0	2.98	1.79	3.57	5.36
704	89.19	5.41	1.35	0	2.70	0.68	0.68	1.36
705	73.37	9.47	1.18	0	5.92	5.92	4.14	10.06
706	68.94	9.32	3.73	0	12.42	1.86	3.73	5.59
707	86.75	8.61	0	0	1.32	1.99	1.32	3.31
708	68.21	10.40	2.31	0.58	16.18	0.58	1.73	2.31
609	81.91	6.38	0	0	7.98	3.72	0	3.72
610	45.83	2.5	0	0	36.67	3.33	11.67	15.00
611	94.27	1.04	1.04	0	0	2.08	1.56	3.64
612	95.96	1.52	1.01	0	0.51	1.01	0	1.01
613	88.65	1.62	1.08	0	3.24	5.41	0	5.41
614	79.17	5.73	0.52	0	8.85	3.13	2.60	5.73
All Teachers Σ	1129.88	83.54	15.08	2.36	102.49	33.28	33.37	66.65
$\bar{X}$	80.71	5.97	1.08	0.17	7.32	2.38	2.38	4.76
By Forms: III $\bar{X}$	80.51	8.09	1.43	0.30	5.66	1.83	2.19	4.02
II $\bar{X}$	80.96	3.13	0.61	0	9.54	3.11	2.64	5.75
By Experience:								
III Experienced $\bar{X}$	80.73	6.23	0.89	0	4.45	3.86	3.86	7.71
Inexperienced $\bar{X}$	80.44	8.72	1.61	0.39	6.06	1.15	1.64	2.79
II Experienced $\bar{X}$	85.28	4.00	0.54	0	5.61	4.57	0	4.57
Inexperienced $\bar{X}$	78.81	2.70	0.64	0	11.51	2.39	3.95	6.35

all teachers and for teachers by grades was 1% but the ranges were 0-4% for Form III teachers and 0-1% for Form II teachers. The inexperienced teachers in both grades had higher scores than the experienced teachers.

"Negative Analogous Digression" Episodes: Teacher variable 22.

Only two teachers, both secondary inexperienced teachers, showed scores for this class of episode.

"Tangential Digression" Episodes: Teacher variable 23.

The average score for all teachers was 7%, but for Form III teachers the average score was 6% with a range of scores of 1% to 16%. For Form II teachers the average score was 10% with a range of scores of 0-37%. However, when the score of teacher 610 was removed the average score for Form II teachers was 4.12% and the range 0-9%.

The scores for inexperienced teachers in both grades were higher than those of the experienced teachers. The score of teacher 610 affected the average percentage score of the inexperienced Form II teachers. When this score was removed the average for this group is reduced to 3%.

"Procedural Digression" Episodes: Teacher variable 24.

The average of scores for all teachers was 2% with an average score for Form III teachers of 2% and 3% for Form II teachers.

The respective ranges were 0-6% and 1% to 5%.

The inexperienced teachers in both grades had lower scores than the experienced teachers.

"Managerial Digression" Episodes: Teacher variable 25.

The average of scores for all teachers was 2%, for Form III teachers 2% and for Form II teachers 3%. The ranges were 0-4% for Form III teachers and 0-12% for Form II teachers. Half of the Form II teachers had scores of 0% and two of the remaining three teachers had scores of about 2%. Only one of the Form III teachers had a zero score. The inexperienced Form III teachers had lower scores than the experienced Form III teachers but the only Form II teachers with scores above zero were the inexperienced teachers.

ii. Episode length: Teacher variables 27-31. Percentage scores were calculated from frequency counts in each category of episode classified by the number of transcript lines in each episode. These are presented in Table VII.

"Class 1" Episodes (1-10 lines): Teacher variable 27.

The average score for all teachers was 67% of all episodes. For Form III teachers the average score was 61% with a range of 47% to 70%. For Form II teachers the average score was 75% with a range of 64% to 87%. The inexperienced teachers in both grades had lower scores than the experienced teachers.

"Class 2" Episodes (11-20 lines): Teacher variable 28.

The average scores were for all teachers 25%; for Form III teachers 28%, with a range of 24% to 34%; for Form II teachers 20%, with a range of 12% to 22%. The inexperienced teachers in each grade had scores slightly higher than the experienced teachers.

TABLE VII

Percentage Scores for Episode Length Categories in all Tapescripts

Teacher	Categories 1	2	3	4	5
Lines:	(1-10)	(11-20)	(21-30)	(31-40)	(41-50)
701	46.97	34.09	13.64	4.55	0.76
702	61.54	24.85	13.01	0.59	0
703	65.48	29.17	4.76	0.59	0
704	69.61	25.68	4.06	0	0.68
705	69.22	23.67	6.51	0.59	0
706	63.97	23.60	8.69	2.48	1.24
707	62.25	30.46	4.64	2.65	0
708	50.29	32.95	12.14	2.31	2.31
609	75.00	22.34	2.13	0.53	0
610	70.00	19.16	5.84	3.33	1.67
611	81.76	17.71	0.52	0	0
612	73.74	22.23	3.54	3.54	0.51
613	87.02	12.43	0.54	0	0
614	64.59	27.6	4.17	2.6	1.04
All teachers $\bar{X}$	67.32	24.71	6.01	1.70	0.59
By Forms: III $\bar{X}$	61.29	28.06	8.43	1.72	0.62
II $\bar{X}$	75.35	20.25	2.79	1.67	0.54
By Experience:					
III Experienced $\bar{X}$	67.35	26.42	5.64	0.59	0
Inexperienced $\bar{X}$	59.27	28.61	9.36	2.10	0.62
II Experienced $\bar{X}$	81.01	17.39	1.34	0.27	0
Inexperienced $\bar{X}$	75.52	21.68	3.52	2.37	0.54

"Class 3" Episodes (21-30 lines): Teacher variable 29.

The average score for all teachers was 6%, and for teachers by grades: Form III 8%, Form II 3%, with ranges of 4% to 14% and 1% to 6% respectively. The inexperienced teachers in each grade had the higher average scores.

"Class 4" Episodes (31-40 lines): Teacher variable 30.

The average score for all teachers and teachers by grades was 2% with ranges of 0-5% approximately for

all teachers. The inexperienced teachers in each grade had the higher average scores.

"Class 5" Episodes (41-50 lines): Teacher variable 31.

The average score for all teachers and teachers by grades was 1%; most teachers in each grade scored below 1%. However, the only group which showed scores greater than zero were the inexperienced teachers in each grade.

iii. A general note on episodes in the classroom discourse. Episodes were described as units of the classroom verbal discourse which were initiated by a Primary Question and which also contained all the related responses and Secondary Questions.

The majority of the transcribed verbal discourse was directly relevant to the prescribed lesson content. The only difference between Form II teachers ("primary" teachers) and Form III teachers ("secondary" teachers) in scores on "Content-relevant" episodes was noted in the greater range of scores for primary teachers.

The type of episode in which the scores had great variation was the "Tangential Digression" episode. Some teachers allowed the discourse to digress much more readily than did others. Three teachers had very low scores on "Content-relevant" episodes.

Little use was made of Analogy in the question-answer exchanges in the lessons; the teachers drew only to a limited extent upon the pupils' knowledge in parallel or related areas.

There was considerable variability among teachers'

scores on the percentage of episodes designated as "Procedural Digression" and "Managerial Digression" episodes. The range was zero to 15% of all episodes when the scores of these two types were considered together.

Generally in the scores of episode types there were wider ranges among primary teachers' scores than among the secondary teachers' scores. The secondary teachers' verbal discourse had significantly higher percentage scores for the longer episodes.

The results showed that there were marked differences in the behaviours of the experienced and inexperienced teachers. The inexperienced secondary teachers drew upon the pupils' analogous knowledge more than any of the remaining three groups of teachers, but the two teachers who allowed classroom discourse upon analogous material without implicitly or explicitly applying it to the lesson topics were inexperienced secondary teachers.

The experienced teachers' classroom discourses were more content-relevant than those of the inexperienced. The classroom discourse of inexperienced teachers digressed from content-related topics considerably more than did that of the experienced teachers. The units of discourse as indicated in episode length, were also significantly greater for the inexperienced teachers than those of the experienced teachers. There was no clear difference between the experienced and inexperienced teachers on the proportion

of lesson time which was directed to classroom management and procedure.

(c) Monologues: Teacher variables 32-44.

All monologues within the three lessons were analysed for design, type, length, and frequency.

i. Monologue design: Teacher variables 32-34. The monologues were classified in terms of their pedagogical purpose. A percentage score was obtained for each classification of all monologues as described in Chapter III, page 61. The percentage scores obtained are shown in Table VIII.

"Summary" Monologues: Teacher variable 32.

The average score for all teachers was 30%, for Form III teachers 38% and for Form II teachers 19%, with ranges of scores 22% to 53% and 13% to 26% respectively. There was no significant difference between the average scores of Form III teachers by experience. The average scores of Form II teachers were 16% for experienced and 20% for inexperienced teachers.

"Introductory" Monologues: Teacher variable 33.

The average score for all teachers was 26%. The average scores for teachers by grades was for Form III teachers 19% with a range of 10% to 33%, and for Form II teachers 34% with a range of 18% to 47%. The scores for teachers by experience showed that inexperienced Form III teachers had higher scores than the experienced Form III teachers. The average scores for experienced Form II teachers was 37% and for inexperienced teachers of that grade 33%.

TABLE VIII

Percentage Scores for Teacher Monologue Design (pedagogical purpose)

Teacher	Monologue Design S Summary	I Introductory	E Expository	Residual Procedural & Managerial*
701	47.43	19.22	29.49	3.85
702	41.79	13.43	44.78	0
703	52.62	15.57	31.15	1.64
704	34.13	18.96	56.88	0
705	23.35	17.76	58.88	0
706	22.00	10.00	68.00	0
707	46.31	23.16	30.53	0
708	39.21	33.33	27.44	0
609	17.50	37.50	45.00	0
610	12.81	17.95	67.94	1.28
611	26.32	47.37	26.32	0
612	24.53	32.08	39.63	3.77
613	13.95	37.21	46.51	2.33
614	16.46	34.18	49.37	0
All teachers $\bar{X}$	29.89	25.55	44.43	0.92
By Forms:				
III $\bar{X}$	38.36	18.92	43.39	0.69
II $\bar{X}$	18.60	34.38	45.80	1.23
By Experience:				
III Expd. $\bar{X}$	37.99	16.66	45.02	0.82
Inexpd. $\bar{X}$	38.48	19.68	42.85	0.64
II Expd. $\bar{X}$	15.73	37.36	45.76	1.17
Inexpd. $\bar{X}$	20.03	32.90	45.82	1.26

*Not employed for statistical purposes.

"Expository" Monologues: Teacher variable 34.

The average score for all teachers and teachers by grades was 43% to 46% with ranges of about 27% to 68% for teachers in both grades. There was no significant difference between teachers on experience.

ii. Monologue type: Teacher variables 35-41. The monologues were classified in terms of their relevance to the prescribed content. Percentage scores were obtained for the monologue types as described in Chapter III, pages 61-62. Table IX shows the percentage scores obtained.

"Overtures" Monologues: Teacher variable 41.

There was wide variation of scores. The average for all teachers was 6%, for Form III teachers 9%, and for Form II teachers 2%. The ranges were 0-28% and 0-5% respectively. Two of the eight Form III teachers had zero scores; three of the six Form II teachers had zero scores. The average scores for experienced teachers in each grade were higher than for the inexperienced, the difference between the Form III teacher groups was approximately 10%.

"Content" Monologues: Teacher variable 35.

The average score for all teachers was 75% and for teachers by grades they were: Form III teachers 69% with a range of 4% to 91%, Form II teachers 82% with a range of 40% to 100%. However, when the score of teacher 708 was removed the average score for Form III teachers was 79%. The average score for experienced teachers in each grade was higher by approximately 4%.

"Incidental" Monologues: Teacher variable 36.

Only three teachers showed scores for this type of monologue, all of whom were Form III inexperienced teachers. For one the score was 67%.

TABLE IX

Percentage Scores for Teacher Monologue Type (relevance to prescribed content)

Teacher	Monologue Type O Overtures	C Content	I Incidental	A Analogous	Aneg Negative Analogous	T Tangential	PM Procedural & Managerial
701	16.66	71.79	3.85	2.56	0	1.28	3.85
702	0	83.58	0	7.46	0	8.96	0
703	27.87	64.75	0	0.82	0	4.92	1.64
704	10.34	79.30	1.72	3.44	0	5.17	0
705	4.67	80.37	0	10.28	0	4.67	0
706	8.00	80.00	2.00	0	2.00	8.00	0
707	5.26	90.53	0	3.16	0	1.05	0
708	0	3.92	66.66	0	9.80	0	19.60
609	3.75	81.25	0	7.50	0	7.50	0
610	5.12	39.74	0	7.69	0	46.15	1.28
611	0	100.00	0	0	0	0	0
612	1.89	90.51	0	3.78	0	0	3.77
613	0	88.36	0	0	2.33	6.98	2.33
614	0	91.15	0	2.53	0	6.33	0
All teachers $\bar{X}$	5.97	74.66	5.30	3.52	1.01	7.22	2.32
By Forms: III $\bar{X}$	9.10	69.28	9.28	3.47	1.48	4.26	3.14
II $\bar{X}$	1.79	81.84	0	3.58	0.39	11.16	1.23
By Experience:							
III Experienced $\bar{X}$	16.27	72.56	0	5.55	0	4.80	0.82
Inexperienced $\bar{X}$	6.71	68.19	12.37	2.77	1.48	4.08	3.91
II Experienced $\bar{X}$	1.88	84.81	0	3.75	0.39	7.24	1.17
Inexperienced $\bar{X}$	1.75	80.35	0	3.50	0	13.12	1.26

"Analogous" Monologues: Teacher variable 37.

The average scores for all teachers and teachers by grades were about 4% with a range for Form III teachers of 0-10% and for Form II teachers of 0-8%. The average score for each group of experienced teachers was higher than that of each group of inexperienced teachers respectively.

"Negative Analogous" Monologues: Teacher variable 38.

Only three teachers showed scores. One Form III teacher had a score of 10%.

"Tangential" Monologues: Teacher variable 39.

The average score for all teachers was 7%. Form III teachers had a score of 4% with a range of 0-9%; Form II teachers had an average score of 11% with a range of 0-46%. However, two of the Form II teachers had zero scores, three about 7% and one 46%. There was little difference between Form III teachers by experience. The average score for the inexperienced Form II teachers was 6% higher than the experienced Form II teachers.

Procedural and Managerial Monologues: Teacher variable 40.

Six teachers had other than zero scores; one Form III teacher had a score of 20%. The average scores were higher in each grade for the inexperienced teachers.

iii. Monologue length and frequency: Teacher variables 42-44. A score was obtained for each of the length categories for all monologues described in Chapter III, page 62. These scores are presented in Table X.

TABLE X

Percentage Scores for Teacher Monologue Length and Number Score for Monologue Frequency

Teacher (Transcript lines:	% Low 5-20	% High More than 20)	Number of Monologues per hour
701	96.15	3.85	46.38
702	98.51	1.49	41.74
703	95.08	4.92	76.80
704	98.26	1.74	37.96
705	100.00	0	69.11
706	98.00	2.00	37.78
707	97.89	2.11	96.48
708	96.07	3.93	36.96
609	100.00	0	64.60
610	92.30	7.70	52.70
611	100.00	0	56.89
612	100.00	0	39.33
613	100.00	0	47.27
614	98.74	1.26	45.65
All teachers $\bar{X}$	97.93	2.07	53.55
By Forms: III $\bar{X}$	97.50	2.51	63.48
II $\bar{X}$	98.51	1.49	40.31
By Experience:			
III Experienced $\bar{X}$	97.54	2.46	72.96
Inexperienced $\bar{X}$	97.48	2.52	60.32
II Experienced $\bar{X}$	100.00	0	55.94
Inexperienced $\bar{X}$	97.76	2.24	32.49

Monologue length: Teacher variable 42.

98% of teacher monologues for the full teacher sample and for teachers by grades were "low", that is, less than 20 lines of transcript. However, the range of average scores for Form III teachers on "high" length monologues, that is, with more than 20 transcript lines, was zero to 6%. Only two Form II teachers had "high" monologue scores, one was 8%. A comparison of the average scores of teachers grouped on experience showed

little difference between the Form III teachers but the only two Form II teachers with scores were inexperienced.

Monologue frequency: Teacher variable 44.

Monologues per hour: For each teacher the total number of monologues during the series of three lessons was divided by the total time taken for the lessons as transcribed.

The average score for all teachers was 54 monologues per hour. The difference between the individual teachers' scores and between the two group average scores was marked.

The range of scores had its outer limits in the Form III teacher group, 37 to 96 monologues per hour with an average score of 63. The range for Form II teachers was smaller, 39 to 65 with a group average of 40. The average for Form III teachers grouped on experience was 73% for experienced teachers and 60% for inexperienced. The Form II teachers' average score for the experienced teachers was 56% and for inexperienced 33%.

iv. A general note on teacher monologues. Three classifications were employed to distinguish the pedagogical purposes of teacher explanations in monologues. Teachers varied considerably in the purposes of monologues. The average scores indicated that less than half the monologues were used for expository purposes, that is, to explain content in detail. There was little difference between primary and secondary teachers' group average scores and ranges which however varied considerably across the full

teacher sample.

The secondary teachers generally made much greater use of summary statements than introductory; the converse applied for the primary teachers.

Consideration of the content-relevance of teacher monologues showed, when one teacher's score was removed, that the majority of teacher explanations were relevant to the prescribed content; most teacher scores were between 80% to 100%. The use of Overture monologues in preparation for the introduction of new content material varied widely among teachers; the secondary teachers' scores were higher and of greater range.

The secondary teachers as a group had much higher scores for the frequency of monologues than did the primary teachers whose average score for questions per hour was high.

A comparison of teachers' scores in each grade grouped on experience showed that experienced teachers used preparatory and other explanations related more to the prescribed content. They used more analogies than the inexperienced teachers.

The experienced teachers' monologues, irrespective of the grade taught, were shorter and more frequent. The inexperienced teachers made more frequent use of summaries and had more monologues devoted to classroom managerial and procedural matters.

Lexicon, Structure and Style in Teacher Language

(d) The lexicon: Teacher variables 45-51.

Each word in each monologue sample was categorised

into a particular grade within the constraints outlined in Chapter III. Percentage scores were calculated for each of the categories of the word list. These are presented in Table XI.

There was a noticeable difference between the average scores and the ranges of scores for the two groups of teachers on the use of vocabulary below grade 4 level. All teachers' vocabulary contained a majority of words of the below grade 4 level.

The average percentage scores for all teachers and teachers by grades showed only a small difference between groups on below grade 4 level vocabulary and small differences between the range of scores of the two groups. On below grade 4 level, Form III teachers' scores ranged from 44% to 63%, but for Form II teachers the range was 55% to 63%.

For the sum of all teachers' scores and for teachers in groups the next highest average scores were found in the grade 6 level. A comparison of the scores of the teachers by experience showed that the inexperienced teachers of both grades had the higher average scores in below grade 4, and grades 4 and 6 vocabulary levels; the experienced teachers' average scores were higher in grade 12. The experienced primary teachers showed higher scores in grade 10 than the inexperienced primary teachers; the experienced secondary teachers were higher in grade 8 than the inexperienced secondary teachers.

TABLE XI

Percentage Scores for Lexicon Categories in Teacher Monologues

Teacher	Categories Below Grade 4	Grade 4	Grade 6	Grade 8	Grade 10	Grade 12	Not classified
701	48.49	2.45	29.43	4.91	5.66	4.53	4.53
702	51.96	5.34	31.34	5.15	1.65	2.27	2.27
703	44.02	5.68	25.56	10.75	2.03	6.90	5.07
704	53.02	3.66	28.52	6.95	2.38	3.66	1.83
705	57.41	3.29	24.69	8.85	0.82	3.91	1.03
706	55.62	3.68	24.61	4.65	3.88	5.04	2.52
707	52.00	8.00	24.42	6.32	2.32	3.16	3.79
708	63.18	6.04	18.91	4.83	1.81	3.02	2.21
609	55.34	5.01	22.22	7.84	1.31	3.27	5.01
610	63.18	4.11	20.75	5.05	0.75	2.99	3.18
611	57.60	5.37	25.94	3.58	0.54	2.86	4.11
612	60.47	4.98	24.58	5.32	1.16	2.16	1.33
613	58.54	4.32	21.20	7.13	2.25	3.94	2.63
614	63.41	4.80	18.05	3.31	2.98	4.97	2.48
All teachers $\bar{X}$	56.02	4.77	24.30	6.05	2.11	3.76	3.00
By Forms: III $\bar{X}$	53.21	4.77	25.94	6.55	2.57	4.06	2.91
II $\bar{X}$	59.76	4.77	22.12	5.37	1.50	3.37	3.12
By Experience:							
III Experienced $\bar{X}$	50.72	4.49	25.13	9.80	1.43	5.41	3.05
Inexperienced $\bar{X}$	54.05	4.86	26.21	5.67	2.95	3.61	2.86
II Experienced $\bar{X}$	56.94	4.67	21.71	7.49	1.78	3.61	3.82
Inexperienced $\bar{X}$	61.17	4.82	22.33	4.32	1.36	3.25	2.78

(e) The morphemic structure and phrase subordination of teacher language: Teacher variables 52-66.

i. Morphemes per group: Teacher variables 52-54. From the frequency count of all verbal groups in the monologue sample, scores were calculated from the three categories of morphemes per group as described in Chapter III, page 63. The count for each group as a percentage of the full number of teacher monologues is presented in Table XII.

TABLE XII

Percentage Scores on Categories of Size of Lexical Unit (morphemes per group) in Teacher Monologues

Teacher	Unit High	Unit Moderate	Unit Low
701	34.95	47.57	17.48
702	23.68	46.49	29.83
703	32.35	34.31	33.33
704	25.64	44.44	29.92
705	41.94	33.33	24.73
706	28.83	34.23	36.94
707	29.29	41.41	29.29
708	26.05	31.61	40.34
609	41.74	39.81	18.45
610	39.60	33.66	26.73
611	29.31	34.48	36.21
612	32.38	24.29	33.33
613	28.43	43.14	28.43
614	29.25	37.74	33.02
All teachers $\bar{X}$	31.67	37.61	29.86
By Forms: III $\bar{X}$	30.34	39.17	30.23
II $\bar{X}$	33.45	35.52	29.36
By Experience:			
III Experienced $\bar{X}$	37.15	33.82	29.03
Inexperienced $\bar{X}$	28.07	40.96	30.63
II Experienced $\bar{X}$	35.09	41.48	23.44
Inexperienced $\bar{X}$	32.64	32.54	32.32

The average of all teachers' scores, and the average scores for each group of teachers were highest in the "moderate" class of monologue, showing that most teachers in the sample employed "clauses" containing between 8 and 13 words. There was a wider variation within the scores of Form III teachers than in the Form II teachers' scores in all categories.

When comparisons were made between teachers by experience the experienced teachers had higher average scores in both grades on the "high" category of lexical unit; the inexperienced teachers' average scores were high on the "low" unit.

ii. Phrase subordination: Teacher variables 55-66. All verbal units, "sentences", in the monologue sample were categorised into the various types of subordination structures as described in the previous chapter, pages 63-64. The frequency count was converted to a percentage score for each category of all "sentences" in the monologue sample. These are presented in Table XIII.

Simple sentences (class 1): Teacher variable 55.

There was variation in the scores of all teachers: the range for Form III teachers was 4% to 22%, and for Form II teachers 9% to 21% with average scores of 13% and 16% respectively.

Simple sentences with one dependent structure (class 2):

Teacher variable 56.

The scores for Form III teachers showed a range of 12% to 20% with an average of 15%; the Form II teachers

TABLE XIII

Percentage Scores for Phrase Subordination in Teacher Monologue Samples

Teacher	"Sentence" Categories											
	Simple Sentence			Multiple			Complex			Compound-complex		
		+1	+2→		1 or 2	3→	1	2	3→		+2	+3
	1	2	3	4	5	6	7	8	9	10	11	12
701	4.23	12.68	2.82	4.23	14.08	2.82	9.86	9.86	12.68	2.82	4.23	19.72
702	18.82	20.00	11.76	2.35	2.35	4.71	7.06	9.41	15.29	1.18	1.18	5.88
703	21.95	12.20	14.63	2.44	4.88	3.66	8.54	8.54	9.76	0	0	13.41
704	12.00	20.00	13.33	1.33	13.33	8.00	4.00	5.33	5.33	0	2.67	14.67
705	8.57	12.86	11.43	1.43	4.29	4.29	5.71	17.14	20.00	0	2.86	11.43
706	14.29	14.29	10.71	2.38	3.57	7.14	4.76	5.95	22.62	0	0	14.29
707	10.29	13.24	8.82	0	1.47	4.41	7.35	5.88	17.65	1.47	0	29.41
708	13.41	17.07	2.44	6.09	2.44	4.88	6.09	6.09	26.83	0	1.22	13.41
609	9.46	16.22	22.97	0	1.35	4.05	6.76	2.70	16.21	0	0	20.27
610	7.81	6.25	17.19	0	4.69	3.13	10.94	6.25	20.31	0	4.69	18.75
611	20.88	16.48	12.09	3.30	3.30	0	1.10	6.60	23.08	0	1.10	12.09
612	14.63	10.98	10.98	3.66	4.88	7.32	9.76	7.32	18.29	1.22	2.44	8.54
613	19.77	17.44	12.79	2.33	3.49	0	8.14	11.63	11.63	1.16	1.16	10.47
614	20.62	19.59	9.28	2.06	5.15	2.06	10.31	10.31	12.37	1.03	0	7.22
All teachers $\bar{X}$	14.05	14.95	11.52	2.26	4.95	4.03	7.17	8.07	16.58	0.63	1.54	14.25
By Forms:												
III $\bar{X}$	12.95	15.29	9.49	2.53	5.80	4.99	6.67	8.53	16.27	0.68	1.52	15.28
II $\bar{X}$	15.53	14.49	14.22	1.89	3.81	2.76	7.84	7.47	16.98	0.57	1.57	12.89
By Experience:												
III Expd. $\bar{X}$	15.26	13.03	13.03	1.94	4.59	3.98	7.13	12.84	14.88	0	1.43	12.42
Inexpd. $\bar{X}$	12.17	16.05	8.31	2.73	6.21	5.33	6.52	7.09	16.73	0.91	1.55	16.23
II Expd. $\bar{X}$	14.62	16.83	17.88	1.17	2.42	2.03	7.45	7.17	13.92	0.58	0.58	15.37
Inexpd. $\bar{X}$	15.99	13.33	12.39	2.26	4.51	3.13	8.03	7.62	18.51	0.56	2.06	11.65

scores ranged from 6% to 20% with an average of 14%. The average for all teachers was 15%.

Simple sentences with two or more subordinate structures (class 3): Teacher variable 57.

The Form II teachers' scores had a higher average (14%) than those of Form III teachers (9%), with similar differences in range between both groups.

Multiple sentences with no dependent structures (class 4): Teacher variable 58.

All the scores were low for this class of sentence; the highest score was 4%. There was no significant difference between the average scores of the Form III and Form II teachers.

Multiple sentences with one or two dependent structures (class 5): Teacher variable 59.

There was a greater range in the Form III teachers' scores (1% to 14%) than in those of the Form II teachers (1% to 5%). The average score for all teachers was 5%, for Form III teachers 6%, for Form II teachers 4%.

Multiple sentences with three or more dependent structures (class 6): Teacher variable 60.

The average scores were between 3% and 5%. The range for all teachers was zero (two Form II teachers) to 8%.

Complex sentences with one subordinate structure (class 7): Teacher variable 61.

The average scores were all about 7%. Form III teachers' scores ranged from 4% to 10%; for Form II

teachers the range was 1% to 11%.

Complex sentences with two subordinate structures (class 8): Teacher variable 62.

The average scores were all about 8% but again the ranges showed some difference. Form III teachers: 6% to 17%; Form II teachers: 3% to 11%.

Complex sentences with three or more subordinate structures (class 9): Teacher variable 63.

The scores in this class of phrase subordination were highest for all teachers and for teachers by groups. All were between 16% and 17%. There was a wider range for Form III teachers (5% to 27%) than for Form II teachers (16% to 23%).

Compound-complex sentences with no subordinate structures (class 10): Teacher variable 64.

Only six teachers had scores other than zero; the average scores were all less than 1%.

Compound-complex sentences with two subordinate structures (class 11): Teacher variable 65.

The average scores were all 1.5% with a range for both groups of teachers of about 0-5%. Five teachers had zero scores.

Compound-complex sentences with three or more subordinate structures (class 12): Teacher variable 66.

The average score for all teachers and for the teachers by grade was about 14%, but the range of Form III teachers' scores, 6% to 29%, was significantly wider than the Form II teachers' scores, 9% to 20%.

iii. A general note on phrase subordination in the teachers' classroom language. A comparison of the rank order of each teacher's scores indicated that a minority of teachers had a classroom language in which "simple sentences" were dominant. There appeared to be little difference between Form III and Form II teachers in this behaviour. However, when the three types of simple sentence scores were summed, the average scores and ranges indicated that the Form III teachers' language had fewer "simple sentences" than did the Form II teachers' language.

When comparisons were made on the basis of the teachers' experience it was found that the inexperienced teachers in both grades had the lower scores generally on categories 4 to 12, that is, multiple, complex, and compound-complex sentences.

(f) The voice system and negation:

Teacher variables 67-69.

Each finite verbal form in the monologue samples was classified according to the traditional grammar system as either active or passive. A count was taken for each, and also for the use of negative forms.

The frequency scores for the voice system were converted to percentages. The frequency counts for the use of negatives were left as raw scores. These scores are presented in Table XIV.

The voice system: Teacher variables 67 and 68.

The average percentage score for all teachers in the use of the active voice was 83%. For Form III

TABLE XIV

Scores for Voice System and Negation Analyses of Teacher Monologues

Teacher	Voice		Negation
	Active %	Passive %	Frequency per 100 transcript lines
701	75.76	24.24	7.5
702	87.62	12.38	9.5
703	67.35	32.65	3.5
704	68.75	31.25	12.0
705	85.26	14.74	14.0
706	83.49	16.51	10.5
707	85.59	14.41	8.5
708	86.06	13.94	7.5
609	88.99	11.01	10.5
610	89.92	10.08	7.0
611	91.43	8.57	8.5
612	84.95	15.05	10.0
613	85.71	14.29	13.5
614	83.75	16.25	8.5
All teachers $\bar{X}$	83.19	16.83	9.36
Teachers by Forms:			
III $\bar{X}$	79.99	20.05	9.13
II $\bar{X}$	87.46	12.54	9.67
By Experience:			
III Experienced $\bar{X}$	76.31	23.70	8.75
Inexperienced $\bar{X}$	81.21	18.83	9.25
II Experienced $\bar{X}$	87.35	12.65	12.00
Inexperienced $\bar{X}$	87.51	12.49	8.5

teachers the average score was 80% and for Form II teachers it was 87%. The range of 67% to 87% for Form III teachers was much wider than the Form II teachers' scores of 84% to 91%. There was no marked difference between the average scores of teachers when compared on experience.

Use of negation: Teacher variable 69.

There was no significant difference between any

average scores, all were about 9%. The ranges also were similar.

(g) The phrase structure: Teacher variables 70-74.

A 'sentence' for the purposes of analysis in this study was defined as a logically unified statement as spoken. The analysis of this group of variables was made from the tapescripts and by replaying the tape-recording of the monologue samples. Each sentence in each teacher's monologue sample was classified under one of the five categories described in the previous chapter, page 65. Incomplete sentences were not classified. The scores for these are presented in Table XV.

Self-embedded phrase structure: Teacher variable 70.

The average scores for all teachers and teachers by grades were all about 7%. However, the range for Form III teachers was 3% to 14% and for Form II teachers the range was 2% to 9%.

Left-branching phrase structure: Teacher variable 71.

The average scores for all teachers and teachers by grades were all 5%. The ranges of scores were also similar.

Enclosed phrase structure: Teacher variable 72.

The average score for all teachers was 10%; for Form III teachers it was 8% but for Form II teachers it was 11%. The Form III teachers' scores had a narrower range (6% to 13%) than the Form II teachers' scores (6% to 21%).

Right-branching phrase structure: Teacher variable 73.

The highest phrase structure scores were found in

TABLE XV

Percentage Scores for Phrase Structure in Teacher Monologues

Teacher	Phrase Structure Types				
	Variable 70 Self-embedded	Variable 71 Left-branching	Variable 72 Enclosed	Variable 73 Right-branching	Variable 74 Simple
701	8.47	6.78	7.63	56.78	20.34
702	5.41	1.80	4.50	64.86	23.42
703	14.52	3.23	6.45	54.03	21.77
704	5.69	5.69	13.01	54.47	21.14
705	5.00	4.00	13.00	61.00	17.00
706	2.65	9.73	6.19	57.53	23.89
707	10.38	3.77	8.49	66.98	10.38
708	3.28	3.28	5.74	63.11	24.59
609	1.94	3.88	21.36	63.11	9.71
610	7.48	3.74	9.35	65.42	14.01
611	8.06	4.03	13.71	47.58	26.61
612	8.70	7.83	7.83	51.30	24.35
613	3.60	2.73	6.31	63.95	23.41
614	8.33	6.67	10.00	50.83	24.17
All teachers $\bar{X}$	6.68	4.80	9.54	58.64	20.34
By Forms: III $\bar{X}$	6.93	4.79	8.13	59.84	20.32
II $\bar{X}$	6.35	4.81	11.43	57.03	20.38
By Experience:					
III Experienced $\bar{X}$	9.76	3.62	9.73	57.52	19.39
Inexperienced $\bar{X}$	5.98	5.18	7.59	60.62	20.63
II Experienced $\bar{X}$	2.77	3.31	13.89	63.53	16.56
Inexperienced $\bar{X}$	8.14	5.57	10.22	53.79	22.29

this type. There was little difference between the average scores which were all about 58%. The ranges of scores for the two groups of teachers were similar.

Simple phrase structure: Teacher variable 74.

These were the second highest scores for all teachers, individually and on average teachers' scores. The average scores were all 20%. The ranges were similar for both groups. The range of all scores was 10% to 27%.

(h) General notes on voice system, negation and phrase structure of teacher classroom language in this study

The extent to which teacher classroom language differs on these variables was more notable in comparisons of individual teachers' scores rather than when comparisons were made of teacher group average scores. Some teachers used the passive voice for about 30% of the verbs employed; most employed the passive voice for 10% to 15% of all verbs. The use of negative forms varied among all teachers also to a significant degree.

In Chapter II a summary was presented of Chomsky's psycholinguistic theories. Included in these was the hypothesis that the use of negative forms and the passive voice had not only transformational but also psychological complexity. The theories also postulated that self-embedded phrase structure made the greatest psychological demand on the hearer and that the "left-branching" sentence made demands upon the hearer's ability to retain unrelated structures. In this study one other recursive operation was found to be commonly used by

teachers: "enclosed" structure. It was suggested that the common use of "self-embedded", "left-branching" and "enclosed" phrase structures together made greater psychological demands upon the pupils than did the common use of "right-branching" phrase structures and the simple sentence.

The sum of teachers' scores on the first three phrase structures was compared with the sum of teachers' scores on the latter two types of phrase structures. These scores are presented in Table XVI in two lists for each group labelled A and B respectively.

The Form II teachers' score, 77% was lower on Group B scores, the less demanding phrase structures, than the Form III teachers' score of 80%. However, there was a range of scores for all teachers of 12% to 27% for Group A scores, the more demanding phrase structures. When compared by experience the experienced secondary teachers' average score was higher than that of the inexperienced secondary teachers for Group A phrase structures, the more demanding structures.

The results indicated that for all these variables there were considerable differences among teachers in the linguistic complexity of classroom language. Some teachers employed linguistic forms which made heavy psychological demands upon the hearers.

(i) Style in teacher classroom language

The various styles described in Chapter III, pages 66-67, were counted for frequency of occurrence. The raw frequency scores were then converted into

TABLE XVI

Grouped Percentage Scores for Phrase Structure in Teacher Monologues

Teacher	Group A: Sum and rank order of percentage scores for self-embedded, left-branching and enclosed phrase structures: Percentage	Rank	Group B: Sum and rank order of percentage scores for right-branching phrase structure and simple sentence: Percentage	Rank
701	22.88	7	77.12	8
702	11.71	14	88.28	1
703	24.20	6	75.80	9
704	24.39	4	75.61	11
705	22.00	9	78.00	6
706	18.57	11	81.42	4
707	22.64	8	77.36	7
708	12.30	13	87.70	2
609	27.18	1	72.81	14
610	20.57	10	79.43	5
611	25.80	2	74.19	13
612	24.36	5	75.65	10
613	12.64	12	87.36	3
614	25.00	3	75.00	12
All teachers $\bar{X}$	21.02		78.98	
By Forms: III $\bar{X}$	19.84		80.16	
II $\bar{X}$	22.59		77.41	
By Experience: III Expd. $\bar{X}$	23.10		76.90	
Inexpd. $\bar{X}$	18.75		81.25	
II Expd. $\bar{X}$	19.91		80.09	
Inexpd. $\bar{X}$	23.93		76.07	

percentages by determining the occurrence for each one hundred lines of tape transcript, except that counts of the use of first and second person (variable 75) and third person (variable 76) were each presented as a percentage of the sum of both and similarly for the use of split infinitives. One score was taken for this: the percentage for split infinitives of all infinitives used. The percentage scores for these variables (teacher variables 75-97) are presented in Table XVII.

The use of personal pronouns: Teacher variables 75 and 76.

All teachers had higher percentage scores for the use of the first and second persons. Secondary teachers had significantly higher average scores and a wider range of scores on the use of the third person. The inexperienced secondary teachers and the experienced primary teachers had the higher scores on the use of the third person.

The use of the split infinitive: Teacher variable 77.

The secondary teachers showed a slightly higher score than the primary teachers. It was only the inexperienced teachers in both grades who scored on this variable. Most teachers had zero scores.

Number disagreement: Teacher variable 78.

The secondary teachers had the slightly higher score. There was little difference between scores for teachers individually and by experience.

Repetitions: Teacher variable 79.

The secondary teachers had a wider range of scores and the higher average score with a marked difference in

TABLE XVII

Scores for Style Indices in Teacher Monologues. Frequency per hundred lines of tapescript.

Teacher	*Variable	75	76	77	78	79	80	81	82	83	84	85	86
701		70	30	0	2.0	12.0	2.0	14.5	2.0	13.5	2.0	0	1.5
702		92.16	7.84	0	2.5	6.5	2.0	7.0	0.5	12.5	4.0	0.5	7.0
703		95.00	5.00	0	2.0	2.0	4.5	12.5	15.5	15.5	4.5	0	7.0
704		68.00	32.00	0	1.0	2.5	0.5	12.5	1.0	7.0	0.5	0	1.0
705		87.01	12.99	0	1.0	1.0	6.5	8.5	21.5	10.5	2.0	1.0	1.0
706		98.21	1.79	0	1.5	2.0	2.5	5.0	2.0	4.5	3.5	1.0	5.5
707		86.00	14.00	9.38	0.5	6.0	3.5	10.5	2.0	10.0	4.0	0	1.5
708		88.51	11.49	7.14	2.5	7.0	7.5	15.0	11.5	9.5	8.5	7.0	6.0
609		91.38	8.62	0	1.0	1.5	6.0	8.0	14.5	6.5	1.0	0	5.5
610		93.75	6.25	0	0.5	2.5	4.0	11.0	15.0	6.5	3.0	0	2.5
611		97.02	2.98	0	1.0	2.0	4.0	4.0	3.0	13.5	4.0	1.5	8.5
612		87.88	12.12	2.5	1.5	1.5	5.5	8.0	9.0	7.5	3.5	1.0	7.0
613		91.18	8.82	0	1.5	3.0	6.5	8.0	7.0	13.0	1.5	1.5	5.5
614		90.48	9.52	12.5	1.5	0	10.5	13.0	12.0	7.0	4.0	1.0	4.5
All Teachers	$\bar{X}$	88.33	11.67	2.25	1.43	3.54	4.68	9.82	8.32	9.79	3.29	1.04	4.57
By Grades: III	$\bar{X}$	85.61	14.39	2.07	1.63	4.88	3.63	10.69	7.0	10.38	3.63	1.19	3.81
II	$\bar{X}$	91.95	8.05	2.50	1.17	1.75	6.08	8.67	10.08	9.0	2.83	0.83	5.58
By Experience:													
III Experienced	$\bar{X}$	91.01	8.99	0	1.5	1.50	5.50	10.50	18.50	13.00	3.25	0.50	4.00
Inexperienced	$\bar{X}$	83.81	16.19	4.13	1.67	6.0	4.67	10.75	3.17	9.50	3.75	1.42	3.75
II Experienced	$\bar{X}$	91.28	8.87	0	1.25	2.25	6.25	8.00	10.75	10.75	1.25	0.75	5.50
Inexperienced	$\bar{X}$	92.28	7.72	3.75	1.13	1.5	6.00	9.00	15.13	8.13	3.63	0.88	5.63

Teacher	*Variable contd.	87	88	89	90	91	92	93	94	95	96	97
701		0.5	0	0	4.0	0	1.0	15.5	2.0	7.5	24	0.5
702		0	0	1.0	2.5	1.0	1.5	23.0	1.0	5.0	28.5	7.5
703		0	3.0	1.5	3.0	2.5	0.5	14.5	1.5	2.0	21.5	4.0
704		0	0	0	3.5	0	4.0	15.0	3.5	4.5	25.0	3.5
705		0	0	0	1.5	0	4.5	12.0	2.0	3.0	26.0	4.5
706		0	0.5	0	3.0	1.0	1.0	14.5	2.0	1.5	22.5	6.0
707		1.0	2.0	0	0.5	0.5	1.0	22.0	1.0	7.5	23.5	3.5
708		2.0	1.0	2.0	0.5	1.0	2.0	24.5	2.5	1.5	21.5	10.0
609		0	0.5	0.5	0	0	4.0	17.5	1.0	2.0	30.0	5.0
610		0.5	0	0.5	0	1.0	3.5	29.0	0.5	3.5	30.0	5.0
611		0	3.0	1.5	0.5	0	6.0	25.0	2.0	2.5	29.5	5.5
612		4.0	0.5	0.5	1.0	0.5	5.0	19.5	1.0	2.0	25.5	6.0
613		0.5	0.5	0	1.0	0.5	3.5	25.5	1.0	5.0	14.0	1.5
614		0	0.5	1.0	1.5	1.0	3.5	18.0	1.0	8.5	27.5	10.0
All Teachers	$\bar{X}$	0.61	0.82	0.61	1.61	0.64	2.93	19.68	1.57	4.0	24.93	5.18
By Grades: III	$\bar{X}$	0.44	0.81	0.56	2.31	0.75	1.94	17.63	1.94	4.06	24.06	4.94
II	$\bar{X}$	0.83	0.83	0.67	0.67	0.5	4.25	22.42	1.08	3.92	26.08	3.83
By Experience:												
III Experienced	$\bar{X}$	0	1.50	0.75	2.25	1.25	2.50	13.25	1.75	2.50	23.75	4.25
Inexperienced	$\bar{X}$	0.58	0.17	0.50	2.33	0.58	1.75	19.08	2.00	4.58	24.17	5.17
II Experienced	$\bar{X}$	0.25	0.50	0.25	0.50	0.25	3.75	21.50	1.00	3.50	22.00	3.25
Inexperienced	$\bar{X}$	0.75	1.00	0.88	0.50	0.63	4.50	22.88	1.13	4.13	28.13	4.13

*Variables 75-97 described on pages 109-113.

scores between this group of teachers on experience; the inexperienced secondary teachers had the higher average score.

Renewals: Teacher variable 80.

The teachers' scores ranged from 0.5 to 10.5 with the primary teachers' average score the higher. When compared on experience, in both grades the experienced teachers had the higher scores.

Stabilisers: Teacher variable 81.

The secondary teachers' scores were higher than those of the primary teachers. The inexperienced teachers in both grades had the greater score.

Hesitations: Teacher variable 82.

The outer limits of the range of teachers' scores (0.5 to 14.5) were in the scores of the secondary teachers, but the primary teachers' average score was the higher. In comparisons by experience, the experienced secondary teachers and the inexperienced primary teachers had the higher average scores.

Initial markers: Teacher variable 83.

The scores were higher for the secondary teachers than those of the primary teachers, and the experienced teachers in both grades than the inexperienced teachers.

Anacoluthon: Teacher variable 84.

On comparison of average scores by grade the secondary teachers' average score was the higher. On comparison by experience the inexperienced teachers scores were the higher.

Forms of abbreviation and deletion: Teacher variables 85-90.

In all these variables apart from the use of phatic communion and ellipsis, the primary teachers had slightly higher average scores. The difference between teachers on experience showed that except for ellipsis the inexperienced secondary teachers' scores were higher. However, the differences between the scores were small for both grades on a comparison by experience.

Slang and jargon: Teacher variables 91 and 92.

There was little variation between the scores of teachers considered individually and in groups on the use of slang and for the use of jargon (that is, teenage idiomatic expressions in particular). When comparisons were made on experience the experienced secondary and the inexperienced primary teachers had the higher scores on both variables.

Phrasals: Teacher variables 93-95.

For the use of phrasal verbs the scores ranged from 12 to 29 with the secondary teachers' average the higher on comparison by grade. The individual scores had narrow ranges and the primary teachers had the higher scores on the other two variables. When compared by experience the higher scores for the three variables were those of the inexperienced teachers in both grades.

Vagueness: Teacher variable 96.

The outer limits of the range of the teachers' scores (14 to 30) and the higher average score were found in the primary teachers' scores. The inexperienced teachers in both grades had higher average scores than

the experienced teachers.

Scientific-emotive: Teacher variable 97.

The range of individual scores was 0.5 to 10 with the secondary teachers' average score the higher. The inexperienced teachers in both grades had higher scores than the experienced teachers.

A general note on style indices in teacher classroom language

Generally there were only limited differences between individual teachers' scores. For most types of abbreviation, slightly less than half the teachers had zero or very low scores, indicating that most teachers used "complete" sentence forms.

Most teachers do not split the infinitive, do not employ sentences in which there is disagreement of number, nor use repetitions and renewals to any great extent.

Teachers vary in their use of idiomatic statements to reinforce or substantiate a statement. An average of approximately 10% of teacher monologue transcript was devoted to these "stabilisers". "Initial markers" had approximately the same scores. A noticeable feature of teacher monologues was the occurrence of sentences containing stabilisers and initial markers at turning points in teacher explanations.

Repetitions, restructured statements ("renewals"), unusual word order ("anacoluthon") and hesitations did not generally form a pattern with individual teachers and teachers' scores were low except for hesitations on which there was a range of 21 per hundred lines of

transcript.

The teachers in this sample made limited use of any form of sentence abbreviation and employed phrasal idiomatic expressions rather than one-word, concise, more sophisticated, precise expressions. The scores for phrasal verbs were high, ranging from 12 to 29 per hundred transcript lines.

The scores generally were high for the incidence of "vagueness" but low on expressions with distinct emotive components.

One prominent feature was that the higher scores for most variables were those of the inexperienced teachers particularly on the various forms of abbreviation, phrasals, and "vague" expressions.

(B) THE PUPIL VARIABLES

For all the pupil variables scores were obtained for:

i. each pupil, N = 470

ii. each class, N = 14

iii. each grade, N = 2; Form III - secondary;
Form II - primary.

(a) The predictor variables: Variables 1-10.

The class mean scores, the standard deviations, and the grade means for each of these are presented in Table XVIII.

1. Social Class: Pupil variable 1.

The median ratings of the Congalton-Havighurst occupational scale were obtained for each pupil except

TABLE XVIII

Class Mean Scores and Standard Deviations for Pupil Variables 1-10

	701		702		703		704		705		706		707		708	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. Social Class	4.48	1.22	4.93	1.86	5.10	1.21	4.57	1.31	4.35	1.21	4.89	1.08	4.85	1.48	5.46	1.19
2. Post-Test	19.17	3.52	15.87	3.02	14.56	3.46	18.04	3.62	16.26	3.90	16.60	4.42	16.44	3.12	11.35	3.17
3. Pre-Test	8.27	3.05	6.93	2.53	7.04	1.76	8.67	2.72	8.42	2.86	8.46	2.97	6.83	2.39	6.12	2.68
Difference 2-3	10.90		8.94		7.52		9.37		7.84		8.14		9.61		5.23	
4. CART	61.59	2.17	54.36	6.59	55.60	5.00	60.79	3.04	57.80	5.55	60.32	3.82	57.48	4.18	49.79	5.77
5. I.Q.	125.20	5.18	108.50	6.57	105.27	5.40	127.20	7.33	120.11	8.15	121.63	9.30	110.62	7.53	98.50	6.09
6. Participation	10.88	7.37	10.83	8.49	12.77	9.19	9.04	6.91	9.48	7.05	10.08	11.76	9.04	7.37	14.00	12.54
7. Lessons Attended	2.97	0.18	2.97	0.18	3.00	0	3.00	0	3.00	0	3.00	0	3.00	0	3.00	0
8. CART Foil	2.23	1.15	6.22	4.46	5.89	3.46	3.41	2.04	4.34	2.80	2.85	1.90	8.56	6.43	7.00	3.49
9. Experience*	0.23	0.42	0.17	0.37	0.13	0.34	0.29	0.45	0.26	0.44	0.18	0.38	0.62	0.49	0.29	0.45
10. Visiting Exp.**	0.27	0.51	0.13	0.34	0.23	0.50	0.21	0.41	0.29	0.52	0.25	0.51	0.14	0.34	0.16	0.37

	609		610		611		612		613		614		Grade Means	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	7 (F.III	6 F.II)
1. Social Class	5.03	1.24	4.82	1.17	4.52	1.40	5.52	1.10	2.91	1.25	5.23	1.15	4.82	4.57
2. Post-Test	10.45	2.84	10.90	2.91	14.58	3.69	13.38	3.42	16.06	4.26	11.19	2.50	16.13	12.81
3. Pre-Test	4.94	1.66	5.00	2.03	6.09	2.51	6.12	2.10	9.23	3.23	6.81	2.29	7.60	6.40
Difference 2-3	5.51		5.90		8.49		7.26		6.83		4.38		8.53	6.41
4. CART	39.94	10.90	43.97	10.48	54.58	6.86	39.67	9.05	61.18	3.03	48.69	6.44	57.29	48.39
5. I.Q.	99.06	8.61	102.71	7.77	119.87	7.91	97.28	9.74	129.20	4.87	106.40	5.22	114.60	109.9
6. Participation	8.79	7.97	8.23	8.38	10.00	10.59	13.32	6.58	8.48	9.67	17.80	16.14	10.71	10.86
7. Lessons Attended	3.00	0	3.00	0	3.00	0	3.00	0	3.00	0	2.96	0.19	2.99	2.99
8. CART Foil	11.82	5.82	9.61	5.30	5.63	4.47	14.38	7.23	3.06	2.45	8.23	4.15	4.75	8.62
9. Experience*	0.35	0.48	0.29	0.45	0.29	0.52	0.0	0	0.43	0.60	0.42	0.69	0.27	0.31
10. Visiting Exp.**	0.03	0.17	0.16	0.45	0.13	0.42	0.20	0.40	0.26	0.50	0.38	0.68	0.21	0.19

*0 = Urban, 1 = Rural, 3 = Northland Experience.
**0 = Nil, 1 = Short Time, 2 = Long Time.

for a few who had incomplete questionnaire forms. The ratings for some occupations were assigned by the author. These are shown in Table XIX.

TABLE XIX

Pupils' Social Class:
Ratings assigned on the basis of judgment

Class	1 Population of Class	2 Number of assigned ratings	3 Number of pupils rated	4 % 2:3
701	35	9	35	25.71
702	33	3	33	9.09
703	34	6	32	18.25
704	31	4	27	14.81
705	35	10	32	31.25
706	34	4	32	12.50
707	32	2	30	6.66
708	30	4	26	15.38
609	37	4	36	11.11
610	36	1	33	3.03
611	35	4	32	12.50
612	29	7	26	26.92
613	37	7	37	18.92
614	28	9	28	32.14
$\bar{X}$		5.29	31.36	

The optimum range of scores is 1.00 down to 7.48. The range of class average scores for Form III classes was 4.35 to 5.46 with a mean of 4.82; for Form II classes the range was 2.91 to 5.52 with a mean of 4.57. The range of class average ratings of standard deviations was 1.06 to 1.48.

2. The Post-test: Pupil variable 2.

The raw scores (maximum = 30) were used. The range for Form III class average scores was 11.35 to 19.17 with a mean of 16.13 and a range in standard

deviations of 3.02 to 4.42. For Form II classes the range of raw scores was 10.45 to 16.06 with a mean of 12.81 and a range in standard deviations of 2.84 to 4.26.

3. The Pre-test: Pupil variable 3.

The raw scores (maximum = 20) were used. The range of Form III class average scores was 6.12 to 8.67 with a mean of 7.60 and a range of standard deviations of 1.76 to 3.05. The Form II range of class average scores was wider: 4.94 to 9.23 with a mean of 6.40 and a range of standard deviations of 1.66 to 3.23.

A note concerning the tests of lesson content knowledge

The differences between the raw scores of the tests showed an average gain of 8.5 marks for the Form III classes and 6.41 marks for the Form II classes with ranges of 5.23 to 10.90 and 4.38 to 8.49 respectively.

4. The Children's Associative Reasoning Test: Pupil variable 4.

The scores of the correct answers were used with the maximum score of 67. The mean score of the Form III class average scores was 57.29 with a range of 49.79 to 61.59 and a range of standard deviations of 2.17 to 6.59. The mean for Form II classes was 48.39 with a range of 39.67 to 61.18 in raw scores and a range in standard deviations of 3.03 to 10.90.

5. Intelligence quotient: Pupil variable 5.

The mean and standard deviation of each class's intelligence quotients were obtained. The range for Form III classes averaged quotients was 98.50 to 127.20. The mean was 114.6 and the range of standard deviations

5.18 to 9.30. For Form II classes the range of averaged quotients was 97.28 to 129.20 with a mean of 109.9 and a range of standard deviations of 4.87 to 9.74.

6. Participation in lessons: Pupil variable 6.

The number of verbal moves each pupil initiated or responded to were counted. The Form III classes' mean score was 10.71 for the three lessons; the Form II classes' mean score was 10.86. The ranges of the average scores were 9.04 to 14.00 and 8.23 to 17.8 respectively. The ranges of the standard deviations were 6.91 to 12.54 for Form III classes' mean scores and 6.58 to 16.14 for Form II classes' mean scores. The scores in each class had varying distributions but none was small.

7. Lessons attended: Pupil variable 7.

Only two classes had other than the maximum score of 3. The Form means were each .01 below that score.

8. The Children's Associative Reasoning Test Foil Score: Pupil variable 8.

The score of selected foil items in the test was used. The mean of Form III classes' scores was 4.75 with a range of 2.23 to 8.56 and a range for standard deviation of 1.15 to 6.43. The Form II classes' average scores had a mean of 8.62, a range of average scores of 3.06 to 14.38 and a range for standard deviations of 2.45 to 7.23.

9. Previous experience of the Northland region and areas of domicile: Pupil variables 9 and 10.

The ratings of 0 to 2 varied among the classes

but there was little difference between the mean scores of the two Forms. The standard deviations indicate a wide variability within classes.

(b) Use of pupil reference materials:

Pupil variables 11-31.

The class mean scores and the grade means for each of these are presented in Table XX.

Each item was rated 0 to 1 indicating checked items. The most commonly used reference materials were encyclopedias from a public library or the home, and reference books on New Zealand from the same sources.

(c) Pupil judgments on the value, interest and difficulty of Social Studies generally and the experimental lessons in particular including judgments on the amount learned:

Pupil variables 32-46.

The class mean scores and Form mean scores are shown in Table XXI.

These variables were scored according to the rating scale on the questionnaire form, a 3-, 4- or 5-point scale in which a rating of 1 indicated "nil" or "low" except for variables 44 and 45 in which the ratings were converse to those ratings used for the other variables.

Judgments on the benefit of Social Studies:

Pupil variables 32 and 33.

These were rated on a 5-point scale. The mean score for each class indicated that pupils regard Social Studies as having only immediate benefit; all the mean scores were higher for variable 32. The mean for Form II scores was higher than that for Form III.

TABLE XX

Pupil Use of Reference Material. Class Mean Scores for Pupil Variables 11-31.

Variable	701 $\bar{X}$	702 $\bar{X}$	703 $\bar{X}$	704 $\bar{X}$	705 $\bar{X}$	706 $\bar{X}$	707 $\bar{X}$	708 $\bar{X}$	609 $\bar{X}$	610 $\bar{X}$	611 $\bar{X}$	612 $\bar{X}$	613 $\bar{X}$	614 $\bar{X}$	Form Means III	Form Means II
11. Encyclopedia	1.00	0.83	0.57	0.92	0.94	1.00	0.48	0.75	0.85	0.74	0.84	0.80	0.94	0.88	0.81	0.85
12. - School	0.50	0.10	0.13	0.21	0.32	0.29	0.24	0.29	0.29	0.19	0.32	0.20	0.40	0.42	0.26	0.31
13. - Public Library or Home	0.96	0.80	0.53	0.83	0.77	1.00	0.03	0.67	0.71	0.71	0.68	0.72	0.89	0.85	0.69	0.76
14. National Geographic	0.20	0.13	0.17	0.08	0.32	0.07	0.21	0.54	0.09	0.29	0.32	0.16	0.31	0.27	0.21	0.24
15. - School	0.00	0.00	0.03	0.04	0.09	0.00	0.38	0.38	0.00	0.19	0.26	0.00	0.00	0.15	0.11	0.09
16. - Public Library or Home	0.20	0.13	0.17	0.08	0.32	0.07	0.10	0.25	0.09	0.19	0.26	0.16	0.31	0.15	0.17	0.19
17. Any N.Z. Book	0.60	0.43	0.33	0.29	0.48	0.46	0.34	0.29	0.41	0.35	0.42	0.16	0.63	0.50	0.41	0.42
18. - School	0.30	0.10	0.03	0.21	0.16	0.18	0.14	0.17	0.21	0.16	0.32	0.08	0.31	0.31	0.16	0.34
19. - Public Library or Home	0.53	0.43	0.30	0.13	0.35	0.39	0.03	0.13	0.35	0.23	0.35	0.12	0.60	0.35	0.29	0.35
20. Students Digest	0.30	0.60	0.10	0.17	0.19	0.14	0.14	0.17	0.12	0.16	0.13	0.04	0.37	0.08	0.23	0.16
21. - School	0.03	0.47	0.03	0.00	0.00	0.00	0.14	0.00	0.03	0.06	0.00	0.00	0.20	0.00	0.09	0.05
22. - Public Library or Home	0.27	0.13	0.07	0.17	0.19	0.14	0.00	0.17	0.09	0.09	0.09	0.04	0.14	0.08	0.14	0.09
23. Weekly News	0.10	0.33	0.27	0.25	0.35	0.14	0.21	0.17	0.32	0.23	0.13	0.08	0.02	0.15	0.23	0.16
24. - School	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25. - Public Library or Home	0.10	0.30	0.27	0.25	0.35	0.14	0.67	0.17	0.32	0.23	0.13	0.08	0.03	0.15	0.21	0.16
26. Jnl. of Agriculture	0.07	0.07	0.13	0.13	0.13	0.00	0.03	0.00	0.00	0.03	0.03	0.00	0.11	0.08	0.07	0.04
27. - School	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.01	0.01
28. - Public Library or Home	0.07	0.07	0.10	0.13	0.13	0.00	0.03	0.00	0.00	0.03	0.03	0.00	0.11	0.04	0.07	0.04
29. Others	0.08	0.20	0.13	0.04	0.16	0.36	0.07	0.17	0.00	0.16	0.09	0.04	0.09	0.04	0.15	0.07
30. - School	0.00	0.03	0.00	0.00	0.00	0.07	0.03	0.13	0.00	0.06	0.00	0.00	0.00	0.00	0.03	0.01
31. - Public Library or Home	0.03	0.20	0.13	0.04	0.16	0.36	0.07	0.13	0.00	0.13	0.09	0.04	0.09	0.04	0.14	0.07

TABLE XXI

Pupil Judgments on Social Studies. Class Mean Scores and Form Mean Scores for Pupil Variables 32-46.

Variable	701 $\bar{X}$	702 $\bar{X}$	703 $\bar{X}$	704 $\bar{X}$	705 $\bar{X}$	706 $\bar{X}$	707 $\bar{X}$	708 $\bar{X}$	609 $\bar{X}$	610 $\bar{X}$	611 $\bar{X}$	612 $\bar{X}$	613 $\bar{X}$	614 $\bar{X}$	Form Means III	Form Means II
(1 = little benefit 5 = great benefit)																
32. S.S. - benefit now	3.23	2.93	3.00	3.71	2.61	3.34	3.24	3.46	2.94	3.23	3.26	3.58	3.29	3.28	3.18	3.24
33. S.S. - benefit after leaving school	2.70	2.34	2.43	2.79	2.52	3.07	2.93	2.96	2.53	2.55	2.97	2.63	2.71	2.88	2.71	2.71
34. S.S. information from reading	0.27	0.17	0.37	0.25	0.23	0.39	0.21	0.38	0.23	0.48	0.39	0.20	0.54	0.54	0.28	0.40
35. from movies	0.07	0.13	0.17	0.04	0.26	0.07	0.10	0.04	0.06	0.03	0.00	0.00	0.06	0.04	0.12	0.03
36. from filmstrips	0.03	0.10	0.07	0.04	0.09	0.04	0.10	0.08	0.09	0.03	0.03	0.20	0.09	0.04	0.07	0.08
37. from usual lessons	0.17	0.27	0.33	0.42	0.23	0.36	2.28	0.33	0.09	0.19	0.26	0.28	0.17	0.19	0.29	0.19
38. from Northland lessons	0.43	0.30	0.00	0.25	0.19	0.11	0.31	0.17	0.53	0.26	0.32	0.28	0.14	0.15	0.22	0.29
(1 = none, 2 = 1 lesson, 3 = more than 1)																
39. Previous Northland lessons	1.07	1.00	1.28	1.04	1.39	1.15	1.04	1.17	1.03	1.23	1.23	1.26	1.06	1.28	1.14	1.17
(1 = none, 2 = little, 3 = fair bit, 4 = lot)																
40. Reading since lessons	1.23	1.31	1.57	1.29	1.32	1.52	1.24	1.48	1.09	1.16	1.23	1.13	1.23	1.72	1.37	1.25
(1 = nil, 2 = a little new, 3 = a fair bit, 4 = a great deal)																
41. How much learned in Northland lessons	3.60	3.28	2.90	3.33	2.94	3.11	3.14	2.83	3.41	2.71	3.35	3.38	3.06	2.84	3.14	3.13
(1 = boring, 2 = little interest, 3 = fairly interesting, 4 = very interesting, 5 = most interesting)																
42. Lesson interest	3.70	2.97	3.03	3.08	2.62	3.00	3.28	2.50	3.24	2.87	3.13	3.29	2.49	2.28	3.03	2.88
(1 = usually boring, 2 = a little interesting, 3 = usually fairly interesting, 4 = usually very interesting)																
43. Usual interest in S.S.	3.00	2.72	3.00	3.33	2.62	3.41	2.79	3.33	2.76	3.09	2.58	2.92	2.89	3.24	3.01	2.90
(1 = very hard, 2 = fairly hard, 3 = fairly easy, 4 = simple)																
44. Lesson difficulty	2.86	2.69	3.03	3.08	2.87	2.71	3.07	2.64	3.29	2.81	3.23	3.00	2.37	2.54	2.87	2.87
45. Usual lesson difficulty	2.70	2.76	2.90	2.74	2.87	2.71	2.71	2.77	2.79	2.77	2.68	2.54	2.54	2.69	2.77	2.67
(1 = very little understood, 2 = some, 3 = most, 4 = all)																
46. Hard to understand were things said	3.33	3.17	2.97	3.63	3.09	3.29	3.25	2.95	3.32	2.94	3.23	3.38	3.06	2.88	3.21	3.13

Judgments on where the pupils "most like getting Social Studies information": Pupil variables 34-38.

These had a 5-point rating scale. The average of Form III class mean scores was equally high on "reading" and "the usual lessons". For Form II the highest average score was "reading" with "the type of lessons we had on Northland" next but considerably lower.

Previous lessons on Northland and reading concerning the lessons: Pupil variables 39 and 40.

The ratings on variable 39 were on a 3-point scale and for variable 40 on a 4-point scale. There was little variation among class and Form average scores. The scores for "previous lessons" ranged from 0.15 to 1.39. The range for "how much have you read since we began the present lessons" was 1.09 to 1.72.

Judgments on how much was learned from the Northland lessons: Pupil variable 41.

These were rated on a 4-point scale. The mean scores were all in the "fair bit" to "a great amount" areas. The range of means for Form III classes was 2.83 to 3.60 with a Form mean of 3.14. The range for Form II classes was 2.71 to 3.41 with a mean of 3.13.

Judgments on lesson interest: Pupil variables 42 and 43.

These were rated on a 5-point scale for variable 42 - interest level of the Northland lessons, and a 4-point scale for the usual Social Studies lessons. There was little difference between the scores of each class on these variables nor between the Form mean scores. The range of scores for variable 42 was 2.49 to 3.29 with

Form means of approximately 3, indicating average ratings of "fairly interesting" for the Northland lessons. The range of scores for variable 43 was 2.58 to 3.41 with Form means of approximately 3, indicating average ratings of "fairly interesting" for the usual Social Studies lessons. The Form III mean scores were slightly higher than the Form II mean scores on both variables.

Judgments on the level of difficulty of lessons:

Pupil variables 44 and 45.

These two variables were rated on a 4-point scale from 1 = "very hard" to 5 = "simple" or "easy". For variable 44 the difficulty level of the Northland lessons, the scores ranged from 2.37 to 3.23 with Form mean scores above 3 for both Form means. The rating of 3 was for the category "most of the things said could be understood".

Pupil assessments on the amount of questioning, expression of opinions, discussion or argument in the lessons and the ranking of school subjects in their order of favouritism:

Pupil variables 47-67.

The class mean scores and Form mean scores are shown in Table XXII.

These variables were scored according to the rating scale on the questionnaire form. The numerical rating was comparable to the degree of comparison, that is, 1 indicated the lowest degree except as where otherwise indicated below.

Pupil assessments comparing the Northland lessons with the usual Social Studies lessons on the amount of pupil answering of questions (Pupil variable 47), opinions and ideas expressed by the pupils (Pupil variable 48) and the amount of argument or discussion (Pupil variable 49)

TABLE XXII

Class Mean Scores and Form Mean Scores for Pupil Variables 47-67

Variable	701 $\bar{X}$	702 $\bar{X}$	703 $\bar{X}$	704 $\bar{X}$	705 $\bar{X}$	706 $\bar{X}$	707 $\bar{X}$	708 $\bar{X}$	609 $\bar{X}$	610 $\bar{X}$	611 $\bar{X}$	612 $\bar{X}$	613 $\bar{X}$	614 $\bar{X}$	Form Means III	Form Means II
47. Answering of Questions 3 = more 2 = same 1 = less than usual	2.57	2.38	2.33	2.54	2.09	2.18	2.07	2.18	2.24	2.19	2.74	2.50	2.60	2.00	2.29	2.39
48. Opinions Expressed 3 = more 2 = same 1 = less than usual	2.17	2.00	2.14	2.33	1.70	1.71	2.29	2.23	2.21	2.03	2.65	2.08	2.09	1.69	2.06	2.14
49. Discussion or Argument 3 = more 2 = same 1 = less than usual	1.43	1.66	1.80	1.67	1.65	1.46	1.54	1.77	1.50	1.57	1.97	1.33	1.57	1.42	1.62	1.57
Amount of Question Answering 1 = none 5 = a great deal																
50. English	3.67	3.07	3.17	2.92	2.35	2.96	3.48	3.00	2.68	2.77	2.39	2.61	2.80	2.64	3.08	2.65
51. Science	3.40	2.97	3.00	3.42	3.09	3.18	3.43	3.59	3.06	3.03	3.09	2.83	3.29	3.60	3.24	3.15
52. Social Studies	3.67	3.45	3.60	3.63	3.61	3.89	3.64	4.05	3.15	3.48	3.29	3.25	3.46	3.44	3.68	3.34
53. Music	2.77	2.48	1.97	2.38	1.32	1.68	2.18	2.41	2.09	1.65	1.70	1.86	2.20	2.16	2.13	1.95
54. Maths.	3.27	3.48	3.23	3.67	2.52	3.32	3.21	3.41	3.53	3.87	3.90	3.41	4.40	3.88	3.24	3.86
55. Art	2.17	1.96	1.53	1.79	1.83	1.86	1.46	2.27	1.73	2.35	1.90	2.18	1.86	1.96	1.85	1.98
Argument or Discussion 1 = none 5 = lot																
56. English	3.70	2.10	3.17	2.42	2.47	3.32	2.85	3.25	2.12	2.13	1.87	1.69	2.63	2.04	2.91	2.11
57. Science	2.60	2.55	2.10	3.25	3.00	2.71	2.89	3.00	2.91	2.65	2.45	2.08	2.37	2.52	2.74	2.52
58. Social Studies	3.70	3.34	3.17	3.46	3.20	4.04	3.37	3.50	2.73	2.83	2.58	2.25	2.97	3.08	3.47	2.75
59. Music	2.03	2.17	1.60	1.92	1.93	1.43	1.85	2.33	1.79	1.40	1.57	1.35	1.60	1.60	1.90	1.57
60. Maths.	2.89	2.93	2.97	3.63	2.40	3.11	2.70	2.96	4.12	3.30	3.19	2.52	2.54	3.44	2.93	3.59
61. Art	1.60	1.93	1.37	1.71	1.72	1.50	1.31	1.96	1.67	2.00	1.67	1.78	1.29	1.76	1.63	1.68
Subjects Liked Most 1 = most favoured 2 = least favoured																
62. English	2.97	3.24	2.50	3.96	3.60	2.79	3.80	3.83	4.32	4.35	4.74	4.43	4.17	3.96	3.29	4.34
63. Science	3.47	4.45	3.07	2.83	2.90	4.18	3.46	3.61	2.65	3.74	3.26	3.61	4.31	3.00	3.50	3.44
64. Social Studies	3.03	3.28	2.80	2.17	2.97	2.15	2.24	2.35	3.59	2.35	2.97	2.75	2.94	2.50	2.65	2.87
65. Music	3.83	3.89	4.63	5.13	5.10	5.29	4.54	4.48	4.59	4.19	3.35	4.13	3.51	5.00	4.60	4.09
66. Maths.	3.00	2.97	4.43	3.25	3.50	3.21	3.68	3.69	2.97	3.19	4.00	3.09	3.11	3.15	3.46	3.26
67. Art	4.70	3.17	3.57	3.67	2.93	3.39	3.25	3.04	2.71	3.16	2.68	2.83	2.91	3.24	3.48	2.91

The variables were each scored on a 3-point scale. The scores for the first variable ranged from 2.00 to 2.74 with Form means of 2.29 for Form III classes and 2.39 for Form II classes. These indicated average assessments of about the "same amount of answering of questions in the Northland lessons as in the usual Social Studies lessons". For the second variable the scores were wider in range: 1.69 to 2.65 with Form means of 2.06 for Form III classes and 2.14 for Form II classes. There was little difference in the range of each set of scores. The assessments on the expression of opinions or ideas varied among the classes but only to a limited extent between the Form grades. The class mean scores for variable 49 ranged from 1.33 to 1.97 with little difference between the ranges and Form means of the two grades. There was in the pupils' assessment "less argument or discussion in the Northland lessons than in the usual Social Studies lessons".

Pupil assessments on a comparison between lessons in various subjects of the amount of question answering:

Pupil variables 50-55.

The variables were rated on a 5-point scale. For most of the Form III classes the highest average score was for Social Studies; English received the highest average score in one class equal with Social Studies; Mathematics had the highest score in one class and was equal with Social Studies in another. For all of the Form II classes Mathematics received the highest average scores and in all except one Social Studies ranked second. On a comparison of Form III with Form II mean

scores for the amount of answering of questions in the six subjects, for Form III the rank order was: Social Studies (3.68), Science and Mathematics (3.24), English (3.08), Music (2.16), Art (1.96). The rank order of the subjects for Form II was: Mathematics (3.86), Social Studies (3.34), Science (3.15), English (2.65), Art (1.98), Music (1.95).

Pupil assessments on a comparison between lessons in various subjects of the amount of argument or discussion:

Pupil variables 56-61.

The variables were rated on a 5-point scale. In all the Form III classes Social Studies had the highest scores, in two classes it was equal to the scores for English. In all except one of the Form II classes Mathematics had the highest scores. In one class Social Studies was highest and second in rank order for four classes. On Form III classes' Form mean scores the rank order was: Social Studies (3.47), Mathematics (2.93), English (2.91), Science (2.74), Music (1.90), Art (1.63). The rank order for Form II classes was: Mathematics (3.59), Social Studies (2.75), Science (2.52), English (2.11), Art (1.68), Music (1.57).

Pupil rankings of subjects in order of favouritism:

Pupil variables 62-67.

The variables were scored as marked by the pupils. A rating of 1 to 6 was given according to selection of favouritism.

Among the Form III classes the most favoured subject with four classes was Social Studies; with two

classes, English; with one class, Science; and with one class, Mathematics. The order in the Form II was with four classes, Social Studies; with one class, English; and with one class, Art. The most favoured subject overall for both Forms was Social Studies.

In the following chapter the intercorrelations among these sixty-seven variables are presented and discussed.

* * *

CHAPTER V

STATISTICAL PROCEDURES AND ANALYSIS OF RESULTS

In the previous chapter the results of the study, the details of the methods used for the collection of the raw data, and the data were presented with notes concerning the calculations and contents of the tables of raw data.

In this chapter the statistical procedures are outlined and the results of those procedures are presented and discussed under the following headings:

A. A general note concerning the procedures.
B. The relationships between the independent variables.
   1. Correlations between teacher questions.
   2. Correlations of episode types and other teacher variables.
   3. Correlations between teacher language variables.
C. The relationships between selected independent pupil variables.
D. The relationship between pupil achievement and selected pupil and teacher independent variables.
   1. A general note on the nature of residual scores.
   2. The procedures employed to obtain pupil achievement residual scores.
   3. The relationship of achievement with the predictor variables.
   4. The analysis of variance of pupil achievement scores.
   5. The relationship of achievement with various pupil

predictor variables divided into equal groups of 3 ability levels.

6. The class average residual achievement scores.
7. The relationship between class average residual achievement scores and selected teacher variables.
8. The relationship between class average residual achievement scores and selected pupil variables.

E. Selected pupil variables from the Attitude Questionnaire which are related to the experimental lessons.

F. Factor analysis of the teacher language variables.

(A) A GENERAL NOTE CONCERNING THE PROCEDURES

In the first chapter the intentions of this exploratory investigation were outlined and discussed. The purpose was to analyse, describe and compare certain aspects of classroom verbal interaction.

The teacher language variables selected were:

1) The logical structure of the verbal interaction as indicated in the types of questions used.
2) The content-relevance of these units.
3) The purpose and content-relevance of teacher explanations ("monologues").
4) The linguistic structure of the teacher monologues.
5) The discourse style employed in the teacher monologues.

The pupil variables selected were:

1) Measures of intelligence and associative reasoning.
2) Attainment in terms of understandings acquired.
3) Attitudes and interests toward school subjects.
4) Parents' socio-economic status.

5) Prior experience of the Northland region and the availability and use of material concerned with the lesson topics.

There were 97 teacher and 67 pupil independent variables selected.

(B) THE RELATIONSHIPS BETWEEN THE INDEPENDENT VARIABLES

Computer calculations of product-moment correlations for these independent variables were undertaken. The matrices of the intercorrelations are presented in Tables LXXIV-LXXVII in Appendix 11, pages 280-284.

From these matrices it can be observed that some teacher variables have significant correlations with other teacher variables. It is proposed to present analyses and discussion upon this data only where it has relevance to the major purposes of this investigation. The correlation coefficients are presented in the following tables.

(a) Correlations among teacher questions

These significant correlations and the remaining data of the matrix in Table LXXIV (page 280) supported the grouping of the questions into three broad groups and justified the use of the grouped questions (teacher variables 16-18) for further statistical analysis. Those questions which were grouped into the category labelled "Describing" (questions 1-6) generally correlated negatively with those grouped as "Exercising" (questions 7-10) and "Reasoning" (questions 11-15). The "Exercising" and "Reasoning" groups generally showed

TABLE XXIII

Intercorrelations among Teacher Primary Questions which correlate p = <.10

Variables Question Types		Correlation Coefficient
1. Defining	4. Giving examples	0.713
	10. Evaluating	-0.519
2. Describing	5. Naming	-0.602
	14. Conditional Inferring	-0.504
3. Procedural description	5. Naming	-0.621
	13. Comparing & Contrasting	-0.460
4. Giving examples	10. Evaluating	-0.487
5. Naming	10. Evaluating	-0.598
6. Stating	7. Exercises	0.796
8. Reporting general	9. Personal Reporting	0.721
11. Opining	14. Conditional Inferring	0.484
	15. Explaining	0.500
12. Classifying	13. Comparing & Contrasting	0.550

negative inter-group correlations. The questions correlated positively overall in intra-group comparison with the exception of question 5 "Naming" which correlated negatively with 2 "Describing" and 3 "Procedural Description". 6 "Stating" and 7 "Exercises" correlated positively.

(b) Correlations of types of episodes and other teacher variables

The data pertinent to this study's purpose are presented in the following three tables and then discussed.

TABLE XXIV

Intercorrelation among Teacher Variables 19-25 Episode Types, and between Episode Types and Variables 32-44 Monologue Design, Type, Length and Frequency which correlate p = <.10

Variables		Correlation Coefficient
19. Content-relevant Episodes and	23. Tangential Digressions	-0.949
	25. Managerial Digressions	-0.849
	34. Expository Design Monologues	-0.596
	36. Content-relevant Monologues	0.755
	38. Analogous Monologues	-0.581
	40. Tangential Monologues	-0.894
	43. High Monologue Length	-0.587
20. Analogous Digressions and	38. Analogous Monologues	0.541
23. Tangential Digressions and	25. Managerial Digressions	0.850
	34. Expository Design Monologues	0.538
	36. Content-relevant Monologues	-0.788
	38. Analogous Monologues	0.454
	40. Tangential Monologues	0.965
	43. High Monologue Length	0.640
	45. Lexicon: Below Grade 4	0.531
	47. Lexicon: Grade 6	-0.521
25. Managerial Digressions and	34. Expository Design Monologues	0.560
	36. Content-relevant Monologues	-0.734
	40. Tangential Monologues	0.838
	43. High Monologue Length	0.677

(c) Correlations between teacher questions per hour and other teacher language variables

TABLE XXV

Intercorrelations between Teacher Variable 26 Questions Per Hour, and Teacher Variables 19-25 Episode Types, and 32-44 Monologue Types, Design and Length which correlate p = <.10

Variables		Correlation Coefficient
26. Questions Per Hour	19. Content-relevant Episodes	0.577
	20. Analogous Digressions	-0.535
	23. Tangential Digressions	-0.455
	25. Managerial Digressions	-0.557
	36. Content-relevant Monologues	0.583
	43. High Monologue Length	-0.603

(d) Correlations between episode length and other teacher language variables

TABLE XXVI

Intercorrelation between Teacher Variables 27-31 Episode Length, and Teacher Variables 42-44 Monologue Length and Frequency which correlate p = <.10

Variables		Correlation Coefficient
Episode Length		
27. 1-10 lines	42. Low Monologue Length	0.468
	43. High Monologue Length	-0.472
30. 31-40 lines	43. High Monologue Length	0.566
31. 41 and more lines	42. Low Monologue Length	-0.702
	43. High Monologue Length	0.558
	44. Monologue Frequency	-0.480

(e) A general note concerning the relationship between teacher questions and episodes and other teacher language variables

Certain teaching behaviours formed syndromes with

strongly related characteristics. The data above indicated that in classroom discourse, within the constraints of the type of lesson and the subject area used in the investigation:

(i) Those teachers in whose classrooms the discourse was directed closely to the topic had little digression to managerial and procedural types of episodes in particular.

Those teachers' explanations were not expository in nature but were designed to summarise or introduce material from the classroom discourse and they were in general also closely relevant to the topic; they were non-analogous, non-tangential, and not of great length.

In those classrooms in which the discourse did contain discourse analogous to the topic the teacher explanations also contained analogous material.

(ii) In those classroom lessons in which discourse was not relevant to the topic the teacher monologues were less directly relevant to topic content, more expository in purpose, analogous and longer than in other classrooms, and the teacher vocabulary was of a more elementary quality.

(iii) Where more discourse was given to classroom management the discourse was more peripheral than central to the prescribed topic, the teacher explanations were more expository, more peripheral to the topic, and lengthy.

(iv) Those teachers who asked the greater number of questions had classroom discourse and explanations related to the topic content, had fewer analogous episodes in the discourse, had less discourse time devoted to classroom management, and did not have lengthy explanations.

(v) In those classroom lessons in which the teachers had short explanations the units of discourse were shorter than in those classrooms in which teacher explanations were more lengthy, and in those lessons in which there were fewer teacher explanations the units of pupil-teacher discourse were long.

(f) Correlations between teacher language phrase subordination, structure and language style

i. Phrase subordination and phrase structure

Tables XXVII and XXVIII below present the relevant data. These are followed by general notes.

Table XXVII presents those correlation coefficients in which $p = <.10$ or the highest in each column. This data indicates that in the lessons of this investigation the teachers who employed the more complex phrase subordination structures during explanations had a tendency toward more complex forms of phrase structure, particularly right-branching phrase structure

ii. Teacher language style

Although the frequency of occurrence of certain teacher-language style traits was low, patterns of language style emerged, some of which are similar to social group language registers. The observance of

TABLE XXVII

Intercorrelation between Variables 55-74 Phrase Subordination and Phrase Structure

Variables		Correlation Coefficient
Phrase Subordination	Phrase Structure	
55. Simple sentence (no subordinate structures)	73. Right-branching	-0.416*
	74. Simple	0.637
56. Simple sentence (1 subordinate)	70. Embedded	-0.363*
	74. Simple	0.386*
57. Simple sentence (2 or more subordinate)	72. Enclosed	0.611
	74. Embedded	-0.459
58. Multiple sentence (no subordinate structures)	72. Enclosed	-0.481
	73. Right-branching	-0.350*
	74. Simple	0.751
59. Multiple sentence (1 or 2 subordinate)	71. Left-branching	0.378*
	73. Right-branching	-0.366*
60. Multiple sentence (3 or more subordinate)	71. Left-branching	0.454
61. Complex (1 subordinate)	70. Embedded	0.323*
	72. Enclosed	-0.314*
	73. Right-branching	0.224
63. Complex (3 or more subordinate)	70. Embedded	-0.319*
	73. Right-branching	0.167*
64. Compound-complex (no subordinate structures)	70. Embedded	0.256
	72. Enclosed	-0.354*
66. Compound-complex (3 or more subordinate)	73. Right-branching	0.426
	74. Simple	-0.775

TABLE XXVIII

Intercorrelations among selected Teacher Variables 78-97 Language Style Indices

Note: Those which correlate p = <.10 are indicated *.

Variables		Correlation Coefficient
78. Number disagreement	79. Repetition	0.433
	81. Stabilisers	0.307
	84. Anacoluthon	0.425
	85. Phatic Communion	0.453
	86. Prosiopesis	0.403
	89. General Abbreviation	0.452
	90. Ellipsis	0.522*
79. Repetitions	80. Renewals	-0.405
	81. Stabilisers	0.416
	82. Hesitations	-0.470*
	83. Initial Markers	0.399
	92. Jargon	-0.488*
80. Renewals	82. Hesitations	0.640*
	85. Phatic Communion	0.426
	90. Ellipsis	-0.533*
	97. Emotive	0.514*
81. Stabilisers	86. Prosiopesis	-0.442
	88. Extraction	-0.370
	92. Jargon	-0.415
	95. Phrasal Adverbs & Adjectives	0.377
84. Anacoluthon	85. Phatic Communion	0.757*
	86. Prosiopesis	0.437
	89. General Abbreviation	0.775*
	91. Slang	0.519*
	97. Emotive	0.672*
85. Phatic Communion	87. Object Deletion	0.374
	89. General Abbreviation	0.586*
	97. Emotive	0.560*
86. Prosiopesis	89. General Abbreviation	0.679*
	91. Slang	0.417
	95. Phrasal Adverbs & Adjectives	-0.476*
	97. Emotive	0.411

- continued -

TABLE XXVIII
continued

Variables		Correlation Coefficient
88. Extraction	90. Ellipsis	-0.480*
	93. Phrasal Verbs	0.400
89. General Abbreviation	91. Slang	0.494*
	97. Emotive	0.650*
90. Ellipsis	92. Jargon	-0.510*
	93. Phrasal Verbs	-0.640*
	94. Phrasal Nouns	0.507*
91. Slang	92. Jargon	-0.411
	97. Emotive	0.302
96. Vagueness	97. Emotive	0.341

number agreement rules would be regarded as essential for New Zealand "standard" English usage. The correlations between number disagreement and other variables such as anacoluthon, phatic communion, prosiopesis, and those other forms of abbreviation are significant; the employment of these in oral language by "educated" groups is not regarded as acceptable English usage.

Other patterns among variables emerge from the data: the correlations between the forms of abbreviation, and the negative correlation between the use of slang and jargon (teenage "cult" expressions). However, these are discussed further under the section later in this chapter dealing with factor analysis of the data.

(C) THE RELATIONSHIPS BETWEEN SELECTED INDEPENDENT PUPIL VARIABLES

Relationship among predictor variables

The pupil variables were submitted to the same treatment as the teacher variables. The matrices for the intercorrelations are presented in Table LXXVIII in Appendix 11, page 285.

The correlation data which have significance for the purposes of this study are presented in the extracts below.

The significant correlations are presented in Table XXIX:

TABLE XXIX

Intercorrelation among Eleven Selected Pupil Predictor Variables which correlate p = <.10

Variables		Correlation Coefficient
2. Post-test	4. CART	0.493
	5. I.Q.	0.532
4. CART	5. I.Q.	0.686
	8. CART Foil	-0.805
5. I.Q.	8. CART Foil	-0.619

The correlation coefficients shown above were expected. The intelligence quotients were obtained from verbally loaded tests.

(D) THE RELATIONSHIP BETWEEN PUPIL ACHIEVEMENT AND CERTAIN INDEPENDENT PUPIL AND TEACHER VARIABLES

An achievement score was obtained for each class. These were then used in computer calculations of product-

moment correlations for selected independent variables.

(a) A general note on the nature of residual scores

Each of the criterion scores discussed in the following sections consists of a class average of pupil 'residual' scores on the criterion measure used. The purpose of using a 'residual' score was to attempt to provide a correction for the influence of extraneous background variables that were thought likely to affect the criterion scores obtained.

The procedure involved in obtaining 'residual' scores was as follows: a regression analysis was carried out on the total pupil population in which the multiple correlation was obtained between a set of predictor variables and the criterion measure. These predictor variables consisted of those background variables (intelligence, prior knowledge, socio-economic status, etc.) thought most likely to have an effect on the criterion score. The standardised regression weights obtained from the analysis were used to predict, for each pupil, an expected criterion score. The difference between the predicted score and the pupil's actual criterion score formed the 'residual' score.

Thus, for each pupil, the residual score consisted of that part of his actual criterion score which could not be predicted from a knowledge of his background experience and ability. When the pupil residual scores are averaged for a particular class, the average residual score provides an estimate of the probable effect of the teacher (and/or class) on the criterion score.

Individual pupil differences are removed by the averaging procedure, so that the average residual score represents that proportion of the criterion scores which cannot be predicted from pupil background experience and ability, and is common to all pupils in the class. It is the best available estimate of the effect of the class teaching experience to which the pupils were exposed.

In discussing each criterion score, information is given about the multiple regression analysis (correlations with the criterion measure, multiple correlation, etc.) as well as information about the average residual scores obtained for each class.

It should be noted that in each regression analysis a number of predictor variables were entered which did not make a statistically significant contribution to the multiple correlation. Predictor variables were selected on the basis of logical relevance. It was felt that it would be more informative and would simplify the work involved in the analysis if all these variables were reported.

Finally, for each criterion score, an analysis of variance was carried out to determine whether significant differences existed between the different classes, and to determine the relative effects of pupil background variables and teachers.

(b) <u>The procedures employed to obtain pupil achievement residual scores</u>

Estimates of achievement for each class were obtained from the results obtained on the achievement test, in two different ways:

1. Scores for all pupils in all classes were entered into a single regression analysis in order to determine the average residual achievement score for each class.
2. Scores for all pupils in all classes were divided into three separate groups. Scores obtained on the pre-test and the CART were standardised and added together to form a composite estimate of each pupil's background knowledge and ability. All pupils in all classes were divided into three equal groups on the basis of these composite scores. The top third was labelled the 'High Ability' group (N = 129), the middle third was labelled the 'Middle Ability' group (N = 125), and the lowest third was labelled the 'Low Ability' group (N = 132). A separate regression analysis was carried out on these groups separately in order to determine the average residual achievement score for each class for each level of pupil ability.

The purpose of this second type of analysis was:

(a) to allow for a more precise estimate of the effectiveness of the teacher, by reducing the range of pupil ability involved in any one of the regression analyses; and

(b) to look for any evidence that a particular teacher was more or less effective with pupils of different levels of ability.

(c) <u>The relationship between achievement and the predictor variables</u>

The averaged residual scores, the means, standard deviations, and rank orders of eleven predictor variables for each class are presented in Table XXX below. The

TABLE XXX

The Averaged Residual Scores, Means, Standard Deviations and Rank Orders of Predictor Variables for Each Class

	Class:	701	702	703	704	705	706	707	708	609	610	611	612	613	614
Class average residual achievement scores and ranking		+2.69 1	+0.73 5	-1.12 12	+0.96 4	-0.46 8	-0.75 10	+0.36 6	-3.36 14	-0.53 9	-0.80 11	+1.14 3	+1.91 2	+0.34 7	-1.99 13
Predictor Variables															
Socio-economic	$\bar{X}$	4.48	4.93	5.10	4.57	4.34	4.89	4.85	5.46	5.03	4.82	4.52	5.52	2.91	5.23
	σ	1.22	1.06	1.21	1.31	1.21	1.08	1.48	1.19	1.24	1.17	1.40	1.10	1.25	1.15
	R	3	9	11	5	2	8	7	13	10	9	4	14	1	12
Pre-test	$\bar{X}$	8.27	6.93	7.04	8.67	8.42	8.46	6.83	6.13	4.94	5.00	6.10	6.12	9.23	6.81
	σ	3.05	2.53	1.76	2.72	2.86	2.97	2.39	2.68	1.66	2.03	2.51	2.10	3.23	2.29
	R	5	7	6	2	4	3	8	10	14	13	12	11	1	9
CART (total)	$\bar{X}$	61.59	54.36	55.6	60.8	57.8	60.3	57.5	49.8	39.9	44.0	54.6	39.7	61.2	48.7
	σ	2.17	6.59	5.00	3.04	5.55	3.81	4.18	5.77	10.9	10.5	6.86	9.05	3.03	6.44
	R	1	9	7	3	5	4	6	10	13	12	8	14	2	11
I.Q.	$\bar{X}$	125.2	108.5	105.2	127.2	120.1	121.6	110.6	98.5	99.1	102.7	119.9	97.3	129.2	106.4
	σ	5.18	6.57	5.40	7.33	8.15	9.30	7.53	6.09	8.61	7.77	7.91	9.74	4.87	5.22
	R	3	8	10	2	5	4	7	13	12	11	6	14	1	9
CART (foil)	$\bar{X}$	2.23	6.22	5.90	3.42	4.34	2.85	8.56	7.00	11.82	9.61	5.63	14.38	3.06	8.23
	σ	1.15	4.46	3.46	2.04	2.80	1.90	6.43	3.49	5.82	5.30	4.47	7.23	2.45	4.15
	R	1	8	7	4	5	2	11	9	13	12	6	14	3	10
Participation in lessons	$\bar{X}$	10.88	10.83	12.77	9.04	9.48	10.08	9.04	14.00	8.79	8.23	10.00	13.32	8.48	17.80
	σ	7.37	8.49	9.19	6.91	7.05	11.76	7.37	12.54	7.97	8.38	10.59	6.58	9.67	16.14
	R	5	6	4	10=	9	7	10=	2	12	14	8	3	13	1
Urban/rural experience	$\bar{X}$	0.23	0.17	0.13	0.29	0.26	0.18	0.62	0.29	0.35	0.29	0.29	0.00	0.43	0.42
	σ	0.42	0.37	0.34	0.45	0.44	0.38	0.49	0.45	0.48	0.45	0.52	0.00	0.60	0.69
	R	10	12	13	8	9	11	1	5=	4	5=	5=	14	2	3
Value of S.S. after school	$\bar{X}$	2.70	2.34	2.43	2.79	2.52	3.07	2.93	2.96	2.53	2.55	2.97	2.63	2.71	2.88
	σ	0.59	0.66	0.67	0.64	0.80	0.77	0.74	0.79	0.88	0.80	0.86	0.81	0.94	0.82
	R	8	14	13	6	12	1	4	3	11	10	2	9	7	5
Interest in these S.S. lessons	$\bar{X}$	3.70	2.97	3.03	3.08	2.61	3.00	3.28	2.50	3.24	2.87	3.13	3.29	2.49	2.28
	σ	0.64	0.85	1.02	0.91	0.87	0.78	0.83	1.00	0.97	1.01	0.79	0.98	0.84	0.92
	R	1	9	7	6	11	8	3	12	4	10	5	2	13	14
Preference for S.S.	$\bar{X}$	3.03	3.28	2.80	2.17	2.97	2.14	2.24	2.35	3.56	2.35	2.97	2.75	2.94	2.50
	σ	1.49	1.84	1.38	1.21	1.35	1.19	1.11	0.91	1.33	1.49	1.40	1.64	1.66	1.50
	R	12	13	8	2	10=	1	3	4=	14	4=	10=	7	9	6

class averaged residual achievement scores and their rank order are presented in Table XXXI. The table also contains the means of the residual scores for each grade. Table XXXII contains the form averaged predictor variable scores and Table XXXIII the coefficients of the correlations between the eleven predictor variables and pupil achievement.

TABLE XXXI

Class Averaged Residual Achievement Scores and Rank Order

Form III			Form II		
Class	Score	Rank	Class	Score	Rank
701	12.69	1			
702	10.73	5	609	9.47	9
703	8.88	12	610	9.20	11
704	10.96	4	611	11.14	3
705	9.54	8	612	11.91	2
706	9.25	10	613	10.34	7
707	10.36	6	614	8.01	13
708	6.64	14			
$\bar{X}$ =	9.88		$\bar{X}$ =	10.01	

TABLE XXXII

Form Averaged Pupil Predictor Variable Scores

		Form III	Form II
Socio-economic	$\bar{X}$	4.82	4.58
	σ	1.27	1.52
Pre-test	$\bar{X}$	7.61	6.40
	σ	2.79	2.82
CART (total)	$\bar{X}$	57.30	48.29
	σ	5.90	11.52
I.Q.	$\bar{X}$	114.6	109.9
	σ	11.74	14.18
CART (foil)	$\bar{X}$	4.75	8.62
	σ	3.70	6.27
Participation in lessons	$\bar{X}$	10.71	10.86
	σ	9.12	10.75
Urban/rural experience	$\bar{X}$	0.27	0.31
	σ	0.44	0.53
Value of S.S. after school	$\bar{X}$	2.71	2.71
	σ	0.75	0.87
Interest in Northland S.S. lessons	$\bar{X}$	3.03	2.88
	σ	0.93	0.99
Preference for S.S.	$\bar{X}$	2.65	2.87
	σ	1.42	1.56

TABLE XXXIII

Intercorrelations between the Ten Pupil Predictor Variables (Pupil Variables 1-10)

	Post-test 2	Pre-test 3	CART 4	I.Q. 5	Participation 6	Attendance 7	CART Foil 8	Domicile 9	North visits 10
1. Social Class	-0.176	-0.191	-0.209	-0.335	0.047	0.024	0.138	-0.144	-0.122
2. Post-test		0.447	0.493	0.532	0.185	0.086	-0.379	0.068	0.096
3. Pre-test			0.387	0.408	0.165	-0.008	-0.350	0.070	0.202
4. CART				0.686	0.035	0.017	-0.805	0.077	0.103
5. I.Q.					0.037	0.014	-0.619	0.069	0.088
6. Participation in Lessons						0.054	-0.063	0.045	0.052
7. Lessons Attended							-0.019	-0.127	-0.088
8. CART Foil								0.002	-0.023
9. Areas of Domicile									0.271

Achievement had a significant positive correlation with Pre-test, CART (total); achievement correlated negatively close to the significant level with CART (foil).

(d) The analysis of variance of pupil achievement scores

The results of the analyses of the variance of total pupil achievement scores are presented in Tables XXXIV and XXXV below.

TABLE XXXIV

Analysis of Variance of Total Pupil Achievement Scores

	S.S.	df	MS	F Ratio
Total	7581.02	392		
Regression	2923.11	11	265.74	21.74
Deviation from R.	4657.91	381	12.225	
Total Residual	4657.91	391		
Between classes	799.30	13	61.48	6.02
Within classes	3858.61	378		

ω^2 Regression = 0.36725 = 36.725%
Teachers = 0.1428 = 14.28% (9.036% of total)

The results show from the F Ratio that, after the effects of pupil predictor measures are removed, there remains a significant difference between classes. The analysis indicated that 36.734% of the Post-test variance was attributable to the predictor variables (the eleven pupil characteristics). Of the remaining variance, 14.28% was attributable to the effects of teachers. In other words, of the total variation in pupil achievement, about 37% is attributable to individual differences between pupils and 9% is attributable to the effects of teachers.

TABLE XXXV

Multiple Regression Analysis for all Pupils (Achievement)

Predictor Variables	Mean	s.d.	Correlation with Achievement
Class level (6 or 7)	6.55	0.50	0.39
Socio-economic status	4.49	1.65	-0.14
Pre-test	7.05	2.92	0.45
CART (total)	52.66	11.82	0.44
I.Q.*	108.10	25.70	0.19
CART (foil)	5.96	5.54	-0.37
Participation in lessons	10.07	10.01	0.19
Urban/rural experience	0.29	0.49	0.07
Value of S.S. at school	3.19	0.84	-0.02
Interest in S.S.	2.94	0.93	0.01
Preference for S.S.	2.69	1.51	-0.10
Achievement	14.64	4.398	

Multiple correlation with achievement: 0.621

*Note: I.Q. scores obtained from school records are obtained mostly from the Otis, which has an expected mean of about 107.

(e) The relationship between achievement and various pupil predictor variables divided into equal groups of three ability levels

Tables XXXVI to XL provide results of analyses for "High", "Middle" and "Low" ability pupils. While these tables are included they are not strictly comparable; in Tables XXXVI, XXXVIII and XL the correlations for the Pre-test and CART (total) scores should approach zero because the pupils were categorised into the three ability groups on the basis of these scores.

There are no correlations with any significance for the eleven predictor variables with "High" and "Middle" ability pupils' achievement. However, for the "Low" ability pupils a significant positive correlation

can be seen between scores obtained for participation in lessons and achievement.

The results of analyses of variance shown in Tables XXXVII, XXXIX and XLI indicate that the difference in the amount of variance between groups which is attributable to the teacher is marked; of the "Middle" ability pupil achievement scores 14.51% of the variance is teacher attributable. For the "High" ability pupils it is 8.77% and for the "Low" ability pupils it is 9.27%. This suggests that teachers have the greatest effects on middle ability pupils, and a relatively lesser effect on high and low ability pupils. This may, however, be an artifact of the lower reliability of the measuring instruments at the extremes of the range.

TABLE XXXVI

Multiple Regression Analysis for High Ability Pupils

Predictor Variables	Mean	s.d.	Correlation with Achievement
Class level (6 or 7)	6.74	0.44	0.17
SES	4.17	1.55	-0.11
Pre-test	10.01	2.40	0.30
CART (total)	60.58	3.73	0.15
I.Q.	113.39	30.94	0.08
CART (foil)	2.86	2.74	-0.06
Participation in lessons	11.46	11.29	0.12
Urban/rural experience	0.35	0.53	-0.06
Value of S.S. at school	3.13	0.84	0.06
Interest in S.S.	2.96	0.92	0.13
Preference for S.S.	2.68	1.40	-0.15
Achievement Score	17.53	3.95	
Multiple correlation with achievement score:	0.461.		

TABLE XXXVII

Analysis of Variance of High Ability Pupil Achievement Scores

	SS	df	MS	F
Total	1992.16016	128		
Regression	423.32739	11	38.48430	2.87007
Deviation from R.	1568.83276	117	13.40883	
Total Residual	1568.83276	127		
Between Classes	282.489766	11	25.680888	2.315854
Within Classes	1286.342994	116	11.089164	

ω^2Regression = 0.137118 = 13.71%
Teachers = 0.101593 = 10.16% (8.76628% of total)

TABLE XXXVIII

Multiple Regression Analysis for Middle Ability Pupils

Predictor Variables	Mean	s.d.	Correlation with Achievement
Class level (6 or 7)	6.63	0.48	0.24
SES	4.51	1.63	-0.13
Pre-test	6.52	1.27	-0.05
CART (total)	56.70	4.44	0.34
I.Q.	111.18	23.06	0.02
CART (foil)	4.56	3.08	-0.18
Participation in lessons	9.21	8.99	0.09
Urban/rural experience	0.29	0.47	0.10
Value of S.S. at school	3.26	0.74	0.10
Interest in S.S.	2.93	0.91	0.07
Preference for S.S.	2.85	1.61	-0.18
Achievement Score	14.61	3.77	

Multiple correlation with achievement: 0.497

TABLE XXXIX

Analysis of Variance of Middle Ability Pupil Achievement Scores

	SS	df	MS	F
Total	1765.78125	124		
Regression	435.36621	11	39.57874	3.36166
Deviation from R.	1330.41504	113	11.77358	
Total Residual	1330.41504	123		
Between Classes	350.505045	13	26.961927	3.026617
Within Classes	979.909995	110	8.908273	

ω^2 Regression = 0.172066 = 17.21%
Teachers = 0.175236 = 17.52% (14.5084% of total)

TABLE XL

Multiple Regression Analysis for Low Ability Pupils

Predictor Variables	Mean	s.d.	Correlation with Achievement
Class level (6 or 7)	6.29	0.45	0.34
SES	4.85	1.66	0.07
Pre-test	4.64	1.80	-0.07*
CART (total)	43.52	9.79	0.24*
I.Q.	100.56	18.46	0.16
CART (foil)	10.53	6.40	-0.16
Participation in lessons	9.84	9.71	0.32
Urban/rural experience	0.22	0.43	0.10
Value of S.S. at school	3.19	0.90	-0.14
Interest in S.S.	2.95	0.93	-0.17
Preference for S.S.	2.56	1.49	-0.13
Achievement Score	11.96	3.59	

Multiple correlation with achievement: 0.528

TABLE XLI

Analysis of Variance of Low Ability Pupil Achievement Scores

	SS	df	MS	F
Total	1690.86035	131		
Regression	470.93457	11	42.81223	4.21129
Deviation from R.	1219.92578	120	10.16605	
Total Residual	1219.92578	130		
Between Classes	227.048825	10	22.704883	2.744132
Within Classes	992.876955	120	8.273975	

ω^2Regression = 0.211113 = 21.11%
Teachers = 0.117496 = 11.75% (9.269% of total)

(f) The class average residual achievement scores

Having obtained for each pupil a residual achievement score, being that part of his actual criterion score not predicted from a knowledge of his background experience and ability, group and class average residual achievement scores were obtained. These are presented in Table XLII below. Table XLIII shows the rank order of classes from these scores and Table XLIV the analysis of these according to teacher experience and grade taught. These tables indicate that, in terms of pupil residual achievement scores, there was little difference between primary and secondary teachers. However, there was a difference in regard to experience; there was a greater spread in the inexperienced teachers' classes' rank order of achievement. Most of the experienced teachers' classes were midway and below in rank order of achievement.

TABLE XLII

Class Average Residual Achievement Scores

Class	Low Ability	Middle Ability	High Ability	All Pupils
701	+2.81	+1.49	+2.48	+2.69
702	+1.80	+1.07	+0.75	+0.73
703	-0.38	-0.40	-1.45	-1.12
704	(No pupils)	+2.15	-0.67	+0.96
705	+1.31	-0.87	-0.45	-0.46
706	(No pupils)	-2.88	-0.20	-0.75
707	+1.18	+0.32	-0.10	+0.36
708	-2.10	-3.17	-5.26	-3.36
609	-1.01	+1.17	(No pupils)	-0.53
610	-0.01	-2.42	-2.06	-0.80
611	+0.09	+2.14	+0.37	+1.14
612	+1.92	+1.95	(No pupils)	+1.91
613	(No pupils)	-1.44	+0.51	+0.34
614	-1.24	-1.18	-4.13	-1.99

TABLE XLIII

Rank Order of Class Average Residual Achievement Scores*

Class	Low Ability	Middle Ability	High Ability	All Pupils
701	1st	4th	1st	1st
702	3rd	6th	2nd	5th
703	11th	8th	11th	12th
704	(No pupils)	1st	10th	4th
705	4th	9th	9th	8th
706	(No pupils)	13th	8th	10th
707	5th	7th	7th	6th
708	14th	14th	14th	14th
609	12th	5th	(No pupils)	9th
610	10th	12th	12th	11th
611	6th	2nd	4th	3rd
612	2nd	3rd	(No pupils)	2nd
613	(No pupils)	11th	3rd	7th
614	13th	10th	13th	13th

*Note: Some classes contained no pupils in one of the three ability groups. In order to estimate ranks which would be comparable across all groups, it was assumed that where there were no pupils in a group, the average residual achievement score would be zero (the expected average).

TABLE XLIV

Rank Orders of Class Average Residual Achievement
Analysed According to Teacher Experience and Form Taught

	Rank Order of Class Achievement Scores					Rank Order of Class Achievement Scores				
		Low Ability	Middle Ability	High Ability	All Pupils		Low Ability	Middle Ability	High Ability	All Pupils
SECONDARY TEACHERS:	703	11	8	11	12	701	1	4	1	1
	705	4	9	9	8	702	3	6	2	5
						704	-	1	10	4
						706	-	13	8	10
						707	5	7	7	6
						708	14	14	14	14
PRIMARY TEACHERS:	609	12	5	-	9	610	10	12	12	11
	613	-	11	3	7	611	6	2	4	3
						612	2	3	-	2
						614	13	10	13	13

(g) The relationship between class average residual achievement scores and selected teacher variables

Note: In the following discussion of correlations between selected variables, it should be noted that with fourteen classes (teachers) involved in each correlation, a coefficient of 0.46 or larger is significant at the .05 level, and a correlation of 0.61 or larger is significant at the .01 level. Correlations of 0.30 and above, which have a probability level of 0.15, will be considered as indicating possible trends.

i. The relationship between pupil achievement and teacher questions

TABLE XLV

Correlation between Class Average Residual Achievement Scores, Teacher Primary Questions and Questions Per Hour

Variable		Correlation Coefficient
1. Question type	1. Defining	0.282
2. Question type	2. Describing	0.079
3. Question type	3. Procedural Description	-0.235
5. Question type	5. Naming	0.008
10. Question type	10. Evaluating	-0.169
11. Question type	11. Opining	0.224
13. Question type	13. Comparing & Contrasting	0.332
14. Question type	14. Conditional Inferring	-0.449
15. Question type	15. Explaining	0.382
16. Grouped Question Types (1-6)	"Describing" Questions	-0.159
17. " (7-10)	"Exercising" Questions	-0.201
18. " (11-15)	"Reasoning" Questions	0.300
26. Questions Per Hour		0.156

Note: Question Types 4, 6-9, and 12 are not included because the majority of teachers had zero scores for these.

In these experimental lessons there was no strong relationship between the types of questions asked by the teachers and pupil achievement. None were found to have statistically significant correlation coefficients. However, there was a slight indication of a relationship between questions calling for explanations, opinions and comparisons and pupil achievement. It should be noted that the "Conditional Inferring" questions, which had a correlation coefficient of -0.449, had a mean percentage score of use by all teachers of less than 3%.

ii. The relationship between pupil achievement and episodes in the classroom verbal interaction

TABLE XLVI

Intercorrelations between Types and Length of Episodes in the Classroom Verbal Interaction and Pupil Achievement

Variable	Correlation Coefficient
Episode Type:	
19. Content Episode	0.570*
20. Analogous Digression	-0.234
21. Incidental Digression	-0.041
23. Tangential Digression	-0.529*
24 and 25. Procedural and Managerial Digressions (grouped)	-0.374
Episode Length:	
27. Class 1 - Episodes of 1-10 lines	0.164
30 and 31. (grouped) Class 4 and 5 - Episodes of 31 and more lines	-0.277

There was a clear relationship between the types of episodes in the classroom verbal interaction and class achievement.

The results presented in Table XLVI show in those classroom lessons in which the discourse was relevant to the prescribed content the achievement of the pupils was high. There was a negative correlation between all other types of episodes and pupil achievement. There was a significant negative relationship between pupil achievement and tangential episodes, indicating that where the discourse is not directed toward the lesson topic the achievement of the pupils is low.

The correlation coefficients for the inter-correlations between "short" and "long" episodes show no statistically significant relationship with pupil achievement. However, it was noted that the correlation between "short" episodes and achievement was positive ($r = +0.164$) and that between "long" episodes and achievement was negative ($r = -0.277$).

iii. The relationship between pupil achievement and teacher monologues

As with the episode relevance data, the data below shows that pupil achievement was significantly related to the relevance of teacher monologues to the prescribed content. The design of monologues showed no statistically significant relationship with achievement. Longer monologues were negatively correlated with pupil achievement.

TABLE XLVII

Intercorrelations between Monologue Design, Relevance to the Prescribed Content, Monologue Length, and Monologues Per Hour

Variable	Correlation Coefficient
Monologue Design:	
32. Summary Monologues	0.168
33. Introductory Monologues	-0.048
34. Expository Monologues	-0.141
Monologue Relevance:	
35. Overture Monologues	0.135
36. Content Monologues	0.601*
38. Analogous Monologues	0.090
40. Tangential Monologues	-0.179
43. "High" Length Monologues - 20+ lines	-0.279
44. Monologues Per Hour	-0.014

iv. The relationship between pupil achievement and teacher language variables

1. The relationship between the lexicon employed in teacher explanations and pupil achievement. This is shown in Table XLVIII.

TABLE XLVIII

Correlations between the Lexical Level in Teacher Monologues and Pupil Achievement

Variable	Correlation Coefficient
45. Below Grade 4 Vocabulary	-0.412
48. Grade 8 Vocabulary	-0.059
50. Grade 12 Vocabulary	-0.249

The results above show that there was a negative relationship between two of the three selected lexical

level variables and pupil achievement. However, the relationship was stronger at the Below Grade 4 level.

2. The relationship between pupil achievement and the morphemic structure employed in teacher monologues. The intercorrelation results are shown in Table XLIX between morphemic structure and achievement.

TABLE XLIX

Intercorrelations between Morphemic Structure of Teacher Monologues and Pupil Achievement

Variable	Correlation Coefficient
Morphemes Per Group:	
52. High - 14 or more	0.025
53. Moderate - 8 to 13	0.336
54. Low - 1 to 7	-0.451

The results indicated that the use of "short" sentence structures in teacher explanations had a negative correlation with pupil achievement. The use of sentence structures of "moderate" length had a positive correlation. Neither correlations reached a statistically significant level.

3. The relationship between pupil achievement and phrase subordination in teacher language. Product-moment correlations were made between pupil achievement and the extremities of the classes of phrase subordination. Simple sentences correlated -0.228 and compound-complex sentences with subordinate structures correlated 0.107 with pupil achievement.

4. The relationship between pupil achievement and the phrase structure employed in teacher explanations. Table L presents the data of intercorrelations between the phrase structure of teacher monologues and pupil achievement. Calculation of product-moment correlation of the sum of the means for self-embedded, left-branching and enclosed structures with achievement were undertaken. Right-branching and simple structures were treated similarly.

TABLE L

Intercorrelations between Phrase Structure of Teacher Monologues and Pupil Achievement

Variable	Correlation Coefficient
70. Self-embedded Structure	0.200
71. Left-branching Structure	0.208
72. Enclosed Structure	0.053
73. Right-branching Structure	-0.221
Self-embedded, Left-branching and Enclosed Structure grouped	0.260
Right-branching and Simple Structure grouped	-0.263

In the classroom lessons of this research the data above indicates that the less-demanding phrase structures of the teacher language had no positive correlation with pupil achievement.

It cannot be postulated from this that the premises of the Chomskian school psycholinguists outlined in Chapter II are not substantiated by this present exploratory investigation. The findings here suggest

that a deeper and more longitudinal study of phrase structure in teacher classroom language would be a worthy research project.

(h) The relationship between class average residual achievement scores and selected pupil variables

i. The relationship between achievement and pupil participation in the experimental lessons: A negative correlation of -0.391 was found.

ii. The relationship between achievement and pupil assessments of selected variables related to pupil attitude:

TABLE LI

Intercorrelations between Selected Pupil Attitude Variables and Pupil Achievement

Variable	Correlation Coefficient
Pupil Variables:	
41. The amount learned in the experimental lessons	0.763*
42. Level of interest of experimental lessons	0.777*
46. Level of difficulty to understand experimental lessons	0.668*

The results showed a high positive correlation between pupil achievement in those classes in which the pupils found the experimental lessons interesting and "easy to understand". Pupils' estimates of the amount learned in the experimental lessons also correlated highly with class average residual achievement scores.

(E) SELECTED PUPIL VARIABLES FROM THE ATTITUDE QUESTIONNAIRE RELATED TO THE EXPERIMENTAL LESSONS

It should be noted that the following are areas of uncertainty expected when pupils express their interests.

(a) Level of pupil interest in lessons

The results of each class average score of estimates of the level of pupil interest in the lessons generated by the lessons themselves were entered into a regression analysis with the results obtained from certain predictor variables and other questions related to the experimental lessons added as further predictor variables.

TABLE LII

Multiple Regression Analysis of Pupil Interest in Lessons

Predictor Variables	Mean	s.d.	Correlation with Interest Criterion
Class level (6 or 7)	6.55	0.50	0.09
Socio-economic status	4.49	1.65	0.00
Pre-test	7.05	2.92	0.00
CART (total)	52.66	11.82	0.00
I.Q.	108.10	25.70	-0.00
Participation in lessons	10.07	10.01	0.11
Value of S.S. at school	3.19	0.84	0.22
Interest in S.S.	2.94	0.93	0.18
Preference for S.S.	2.69	1.51	-0.09
Interest in lessons	2.96	0.98	
Multiple correlation with interest criterion: +0.282			

The only variables which made any relatively significant contribution to the multiple regression coefficient were class level and the final three predictor

variables which were other pupil estimates concerning the experimental lessons.

Table LIII presents the class average residual interest scores, and Table LIV the analysis of these according to teacher experience and grade taught.

TABLE LIII

Class Average Residual 'Interest in Lessons' Scores

Class	Average	Rank Order	Class	Average	Rank Order
701	+0.654	1st			
702	-0.020	8th	609	+0.409	2nd
703	+0.075	6th	610	-0.002	7th
704	-0.033	9th	611	+0.334	3rd
705	-0.264	11th	612	+0.162	5th
706	-0.115	10th	613	-0.320	12th
707	+0.288	4th	614	-0.673	13th
708	-0.707	14th			

TABLE LIV

Rank Orders of Pupil Residual 'Interest in Lessons' Scores Analysed According to Teacher Experience and Form Taught

	Experienced Teachers		Inexperienced Teachers	
SECONDARY TEACHERS:	703	6th	701	1st
	705	11th	702	8th
			704	9th
			706	10th
			707	4th
			708	14th
PRIMARY TEACHERS:	609	2nd	610	7th
	613	12th	611	3rd
			612	5th
			614	13th

The above results indicate that there were no differences between teachers on interest generated in lessons by the lessons themselves in terms of teacher experience nor in form taught.

The analysis of variance of lesson interest scores is presented in Table LV below.

TABLE LV

Analysis of Variance of 'Interest in Lessons' Scores

	S.S.	df	MS	F
Total	359.31104	377		
Regression	28.54337	9	3.17148	3.52848
Deviation from R.	330.76782	368	0.89883	
Total Residual	330.76782	376		
Between Classes	33.378624	13	2.567586	3.134054
Within Classes	297.389196	363	0.819254	

ω^2 Regression = 0.056783 = 5.68%
Teachers = 0.068544 = 6.8544% (6.465187% of total)

The analysis showed that the pupils' interest in the lessons as generated by the lessons was 5.68% whereas the contribution of the teachers was 6.47%. This indicated that the expression by pupils of their interest in lessons was an unstable index which could not be predicted except only in very general terms.

The two figures above are similar. When they were compared with pupil achievement it was concluded that for a prediction of the degree of interest pupils will have in lessons the best means is by a study of the teacher; the predictions regarding pupil achievement are best made from factors such as those in the pupil

predictor variables.

(b) Level of difficulty in understanding the lessons

The results of this question were entered into a regression analysis with measures of pupil ability and background experience as predictor variables.

TABLE LVI

Multiple Regression Analysis of 'Difficult to Understand' Scores

Predictor Variables	Mean	s.d.	Correlation with Understanding Scores
Class level (6 or 7)	6.55	0.50	+0.075
Socio-economic status	4.49	1.65	-0.052
Pre-test	7.06	2.94	0.210
CART (total)	53.56	9.90	0.085
I.Q.	108.10	24.84	0.079
CART (foil)	6.04	5.54	-0.096
Urban/rural experience	0.28	0.48	0.036
Interest in S.S.	2.96	0.90	0.105
Difficult to understand score	3.185	0.641	
Multiple correlation with understanding score:	0.251		

The only variables which made any contribution to the multiple regression coefficient were the pre-test and interest in Social Studies. This would indicate that in terms of individual differences between pupils the expression of the lesson difficulty as they found them was a product of prior knowledge and interest in the subject generally.

The class average residual 'Difficulty to Understand' scores and the analysis of those scores according

to teacher experience and grade taught are presented in Tables LVII and LVIII.

TABLE LVII

Class Average Residual 'Difficult to Understand' Scores

Class	Average	Rank Order	Class	Average	Rank Order
701	+0.076	5th			
702	+0.046	7th	609	+0.241	3rd
703	-0.223	13th	610	-0.162	10th
704	+0.360	1st	611	+0.126	4th
705	-0.146	9th	612	+0.315	2nd
706	+0.029	8th	613	-0.213	12th
707	+0.057	6th	614	-0.247	14th
708	-0.175	11th			

TABLE LVIII

Rank Order of Class Average Residual Lesson Difficulty Scores Analysed According to Teacher Experience and Grade Taught

	Experienced Teachers		Inexperienced Teachers	
SECONDARY TEACHERS:	703	13th	701	5th
	705	9th	702	7th
			704	1st
			706	8th
			707	6th
			708	11th
PRIMARY TEACHERS:	609	3rd	610	10th
	613	12th	611	4th
			612	2nd
			614	14th

The spread in the results above indicates that there is conclusive evidence that neither experience of the teachers nor the grade taught influenced the rank order of class lesson difficulty scores.

The analysis of variance of the lesson difficulty scores is presented in Table LIX.

TABLE LIX

Analysis of Variance of 'Difficulty of Understanding What Was Said' Scores

	S.S.	df	MS	F
Total	155.03470	377		
Regression	9.78150	8	1.22269	3.10610
Deviation from R.	145.25320	369	0.39364	
Total Residual	145.25320	376		
Between Classes	14.264174	13	1.097244	3.040712
Within Classes	130.989026	363	0.360851	

ω^2 Regression = 0.042672 = 4.267%
Teachers = 0.065743 = 6.574% (6.2938% of total)

The analysis shows that the difficulty level of what was said is more attributable to the teacher than to individual differences. As with the results of 'Interest in Lessons' scores so in the level of difficulty of what was said, the teacher has more influence than directly on pupil achievement.

(c) Pupil estimates on 'How much was learned'

The results of each class average score of pupil estimates on 'how much was learned' were entered into a regression analysis with certain predictor variables, two other questions and pupils' ranked preference for Social Studies.

TABLE LX

Multiple Regression Analysis of 'How much did you learn?' Scores

Predictor	Mean	s.d.	Correlation
Class level (6 or 7)	6.54	0.50	0.007
Social class	4.49	1.65	-0.006
Pre-test	7.06	2.94	0.051
CART (total)	53.56	9.91	0.007
I.Q.	108.56	24.84	0.110*
Participation	9.96	9.62	0.094
CART (foil)	6.04	5.54	-0.011
Urban/rural experience	0.28	0.48	-0.056
Value of S.S. at school	3.21	0.80	0.225*
How interesting in general is S.S.?	2.96	0.90	0.107*
Ranked pref. for S.S.	2.69	1.50	-0.056
How much did you learn?	3.132	0.712	
Multiple correlation with 'learning' criterion: +0.276			

The only variables which made any contribution to the multiple regression coefficient were Intelligence Quotient, the Value of Social Studies at School and how interesting in general the pupils found Social Studies.

Table LXI presents the class average residual learning scores and Table LXII presents these analysed according to teacher experience and grade taught. The results indicate that teacher experience and grade taught influenced that rank order of scores in pupils' estimations of how much was learned in the experimental lessons.

The analysis of variance of the scores is presented in Table LXIII.

TABLE LXI

Class Average Residual 'How much did you learn?' Scores

Class	Average	Rank Order	Class	Average	Rank Order
701	+0.506	1st			
702	+0.187	4th	609	+0.382	2nd
703	-0.220	10th	610	-0.380	12th
704	+0.068	6th	611	+0.224	3rd
705	-0.093	8th	612	+0.167	5th
706	-0.499	14th	613	-0.099	9th
707	+0.015	7th	614	-0.306	11th
708	-0.399	13th			

TABLE LXII

Rank Order of Class Residual Scores for 'How much did you learn?' Analysed According to Teacher Experience and Form Taught

	Experienced Teachers		Inexperienced Teachers	
SECONDARY TEACHERS:	703	10th	701	1st
	705	8th	702	4th
			704	6th
			706	14th
			707	7th
			708	13th
PRIMARY TEACHERS:	609	2nd	610	12th
	613	9th	611	3rd
			612	5th
			614	11th

TABLE LXIII

Analysis of Variance of 'How much did you learn?' Scores

	S.S.	df	MS	F
Total	191.37775	377		
Regression	14.57498	11	1.32500	2.74288
Deviation from R.	176.80278	366	0.48307	
Total Residual	176.80278	376		
Between Classes	27.467696	13	2.11290	5.13599
Within Classes	149.335084	363	0.411391	

ω^2 Regression = 0.04827 = 4.827%
Teachers = 0.124819 = 12.4819% (11.879399% of total)

The analysis showed that the pupils' estimates of how much was learned were significantly more attributable to the teacher than to individual differences. Again, on the pupils' awareness of how much was learned the teacher had more influence than he had directly on pupil achievement.

The results above suggest that the pupil may have had insights into what was being learned during classroom lessons. Perhaps the pupils made corrections on learning as a response to the teacher.

(F) FACTOR ANALYSIS OF TEACHER LANGUAGE VARIABLES

It was decided to bring together all teacher language data for the purpose of analysis to determine whether there were any underlying language patterns. Because some of the 97 independent teacher variables were the inverse of others, and some were close to being duplicates of others, the product-moment coefficients of

48 only of the teacher variables were employed in the analysis. A standard IBM programme was used which carried out a principal components analysis followed by a varimax rotation of the principal factors.

The most acceptable solution was an eight-factor solution which accounted for 82.32% of the variance in correlations between the 48 original linguistic variables.

The following tables present the results of the analysis.

Factor analysis data

A note concerning the methods employed hereafter: The variables most highly loaded in each factor were converted to standard (T) scores for use in relating these with achievement. The means for these standard scores for each teacher were correlated with class residual achievement scores.

(a) Factor One

TABLE LXIV

Significant Language Data for Factor One

Variable	Factor Loading
2. Active voice as percentage of passive	-0.908
9. Grade 12 vocabulary	0.763
26. Phrasal verbs	-0.758
21. Ellipsis	0.751
45. Phrase subordination class 9	-0.705
23. Extraction	-0.625
Proportion of matrix variance : 19.2%	

This factor was related to the high use of the active voice, of difficult vocabulary, and of ellipsis;

the low use of phrasal verbs, of contracted private communications, and of complex sentences with many subordinate structures. In summary the factor was related to simple language using the active voice with avoidance of the use of difficult vocabulary and sentence structure.

The following table presents the language scores of each teacher for the significant language scores in Factor One:

TABLE LXV

T Scores for Significant Language Data Variables in Factor Analysis : FACTOR ONE

Teacher	Teacher Variables 2 Active Voice	9 Grade 12 Vocab.	26 Phrasal Verbs	21 Ellipsis	$\bar{X}$	Rank
701	60.047	56.058	58.073	67.764	60.486	2
702	44.001	38.213	43.583	56.629	45.629	9
703	71.447	74.728	60.005	60.340	66.630	1
704	69.547	49.165	59.039	64.052	60.451	3
705	47.190	51.163	64.834	49.205	53.098	5
706	49.596	60.072	60.005	60.340	57.503	4
707	46.748	45.250	45.515	41.781	44.824	12
708	46.111	44.131	40.685	41.781	43.177	13
609	42.144	46.101	54.209	61.930	51.096	8
610	40.885	43.914	60.005	61.930	51.684	7
611	38.843	42.901	39.719	41.781	40.811	14
612	47.619	37.357	50.345	45.493	45.204	11
613	46.579	51.403	38.753	45.493	45.493	10
614	49.239	59.505	53.243	49.205	52.798	6

The correlation coefficient resulting from a comparison of the above scores with class residual achievement scores was 0.015 showing that there is no significant relationship between the use in teacher explanations of the language variables in the table above

and pupil achievement.

(b) Factor Two

TABLE LXVI

Significant Language Data for Factor Two

Variable	Factor Loading
40. Phrase subordination class 4	0.872
18. Phatic communion	0.785
11. Number disagreement	0.776
39. Phrase subordination class 3	-0.769
17. Anacoluthon	0.768
33. Enclosed phrase structure	-0.698
35. Simple sentence	0.583
Proportion of matrix variance : 15.0%	

This factor was related to the high use of the following: multiple sentences (simple sentences co-ordinated with conjunctions), simple sentences with no subordinates, anacoluthon (unusual word order), phatic communion (one word private communications), and number disagreement. It also related to the low use of enclosed phrase structure (principal clause preceded and followed by subordinate sentence structures), and low use of simple sentences with three or more subordinate structures. In summary this factor is related to the use of simple sentence structures with non-pedantic use of certain grammatical and syntactic forms.

Table LXVII presents the language scores of each teacher for the sentence and phrase structure scores in Factor Two and phatic communion:

TABLE LXVII

T Scores of Significant Language Data Variables in Factor Analysis : FACTOR TWO

Teacher	Teacher Variables					$\bar{X}$	Rank
	40 Phrase Sub. 4	18 Phatic Communion	39 Phrase Sub. 3	33 Enclosed Phrase Struct.	35 Simple Sentence		
701	61.461	55.713	66.771	54.272	49.996	57.643	2
702	48.511	49.803	49.532	61.270	55.650	52.953	5
703	51.060	55.713	43.989	56.906	52.629	52.059	7
704	44.639	55.713	46.498	42.248	51.461	48.112	12
705	45.193	49.803	50.177	42.266	43.865	46.261	13
706	50.723	49.803	51.548	57.481	56.520	53.215	4
707	63.104	55.713	55.201	52.349	31.713	51.616	10
708	72.263	82.897	67.504	58.497	57.798	67.792	1
609	63.104	55.713	27.915	23.575	30.483	40.158	14
610	63.104	55.713	39.061	50.426	38.376	49.336	11
611	56.041	52.561	48.899	40.679	61.511	51.938	8
612	58.142	49.803	51.044	53.833	57.353	54.035	3
613	50.402	52.561	47.544	57.231	55.656	52.679	6
614	48.870	49.803	54.317	48.973	57.021	51.797	9

The correlation coefficient resulting from a comparison of the scores above with class residual achievement scores was -0.220 showing that there was a negative relationship between pupil achievement and the use by the teacher of simple sentence structures, simple phrase structures and phatic communion, a form of personal simple communication. The correlation coefficients resulting from a correlation coefficient of Factor Two language scores and the pupils' estimations of the level of difficulty in understanding the experimental lessons and the level of interest generated by the lessons were -0.312 and -0.319 respectively. This again showed a negative relationship of the use by the teacher of simple sentence and phrase structures and phatic communion with the interest and ease of understanding of the lessons.

(c) Factor Three

TABLE LXVIII

Significant Language Data for Factor Three

Variable	Factor Loading
29. Negation	-0.885
31. Embedded phrase structure	0.738
24. Slang	0.652
1. Impersonal pronouns	-0.599
38. Phrase subordination class 2	-0.524
Proportion of matrix variance : 11.1%	

This factor was related to the high use of the following: embedded phrase structure, slang, personal pronouns, and the low use of negation and simple

sentences with one dependent structure.

The factor was difficult to interpret as a significant dimension.

The standard scores for Factor Three are presented in Table LXIX:

TABLE LXIX

T Scores for Significant Language Data Variables in Factor Analysis : FACTOR THREE

Teacher	Teacher Variables 29 Negation	31 Embedded P.S.	38 Phrase Sub. 2	$\bar{X}$	Rank
701	56.774	55.225	55.798	55.932	4
702	49.479	46.300	37.090	44.289	11
703	71.364	72.858	57.037	67.086	1
704	40.360	47.120	37.090	41.487	13
705	33.065	45.105	55.345	44.505	10
706	45.831	38.265	51.694	45.263	9
707	53.126	60.795	54.366	56.096	3
708	56.774	40.088	44.578	47.147	8
609	45.831	36.180	46.750	42.920	12
610	58.597	52.338	72.230	61.055	2
611	53.126	54.042	46.077	51.082	6
612	47.655	55.883	60.153	54.563	5
613	34.889	41.032	43.628	39.850	14
614	53.126	54.826	38.144	48.699	7

When correlated with pupil residual achievement scores the correlation coefficient was 0.041.

There was no correlation between Factor Three, which is largely uninterpretable, and pupil achievement.

(d) Factor Four

TABLE LXX

Significant Language Data for Factor Four

Variable	Factor Loading
28. Phrasal adjective and adverb	-0.926
46. Phrase subordination class 10	-0.869
8. Grade 10 vocabulary	-0.632
39. Phrase subordination class 3	0.511
7. Grade 8 vocabulary	0.468
12. Repetition	-0.462
Proportion of matrix variance : 9.8%	

This factor related to low use of the following: phrasal adjectives and adverbs, compound complex sentences, grade 10 vocabulary, and moderately low use of repetition. It was related also to the moderately frequent use of simple sentences with subordinate structures and grade 8 vocabulary.

The standard scores for Factor Four are presented in Table LXXI.

The standard scores for Factor Four when correlated with pupil residual achievement scores had a correlation of -0.315; when correlated with level of interest the coefficient was -0.159; when correlated with ease of understanding the coefficient was -0.060. These results indicated that there was no relationship of pupil achievement, lesson interest, and ease of understanding with teacher language in which there was simple sentence structures and vocabulary approximately at the grade level appropriate to the pupil sample. However, there was a tendency to a negative correlation between pupil

achievement and the three variables forming this factor.

TABLE LXXI

T Scores for Significant Language Data Variables in Factor Analysis : FACTOR FOUR

Teacher	Teacher Variables 28 Phrasal Adj. & Adv.	8 Grade 10 Vocab.	7 Grade 8 Vocab.	$\bar{X}$	Rank
701	35.428	24.118	44.522	32.363	14
702	45.837	53.357	45.702	47.230	10
703	58.327	50.595	72.693	56.045	1
704	47.918	48.056	54.347	48.221	9
705	54.163	59.383	63.515	54.906	2
706	60.408	37.126	43.274	45.843	11
707	35.428	48.469	51.323	43.987	12
708	60.408	52.181	44.131	49.821	6
609	58.327	55.853	58.669	53.853	3
610	52.082	59.932	45.182	49.940	5
611	56.245	61.470	38.097	49.594	7
612	58.327	56.906	46.479	51.322	4
613	45.837	48.969	55.227	48.563	8
614	31.265	43.656	36.811	39.363	13

(e) Factor Five

TABLE LXXII

Significant Language Data for Factor Five

Variable	Factor Loading
13. Renewals	0.886
6. Grade 6 vocabulary	-0.857
15. Hesitations	0.684
3. Split infinitives	0.632
4. Below grade 4 vocabulary	0.631
Proportion of matrix variance : 8.2%	

Factor Five was related to the following: the high use of renewals, hesitations, split infinitives and grade 4 vocabulary; the low use of grade 6 vocabulary.

The standard scores for Factor Five are presented in Table LXXIII:

TABLE LXXIII

T Scores for Significant Language Data Variables in Factor Analysis : FACTOR FIVE

Teacher	Teacher Variables 13 Renewals	6 Grade 6 Vocab.	15 Hesita-tions	4 Below Grade 4 Vocab.	$\bar{X}$	Rank
701	39.809	36.688	40.670	36.923	38.523	13
702	39.809	31.730	38.456	42.949	38.236	14
703	49.321	46.739	60.595	29.150	46.451	9
704	34.102	39.052	39.194	44.787	39.284	12
705	56.930	48.497	69.450	52.416	56.946	4
706	41.711	49.193	40.670	49.311	45.221	10
707	45.516	49.692	40.670	43.021	44.725	11
708	60.735	63.985	54.691	62.443	60.464	2
609	55.028	55.397	59.119	48.820	54.591	5
610	47.418	59.224	59.857	62.441	57.235	3
611	47.418	45.749	42.146	52.755	47.017	8
612	53.126	49.264	51.002	57.728	52.780	7
613	56.930	58.048	48.050	54.377	54.351	6
614	72.149	66.235	55.429	62.845	64.165	1

When correlated with pupil residual achievement the correlation coefficient was -0.678 which showed a high negative correlation between achievement and the use of restructurings, hesitations, vocabulary at a level approximately 3 years below that of the pupils in the sample, and little use of more appropriate vocabulary.

When correlated with the interest level of the lessons the correlation coefficient was -0.661, and with ease of understanding it was -0.533. Again a significant negative correlation was revealed.

(f) Factors Six, Seven and Eight

The proportion of matrix variance for these was 7.0%, 6.2% and 4.3% respectively and because of this no analyses nor interpretations of these factors were undertaken.

(g) A general note on the results of the factor analysis

The interpretations of the results of the analysis have been presented above.

An eight-factor factor solution was employed, five of which had significant matrix variances to qualify for further examination.

The analysis revealed that there were regions of teacher language behaviour in which teachers performed quantitatively and consistently. When correlated with pupil achievement scores, lesson interest scores, and scores for ease of understanding of lessons, three factors had significantly high scores. All three were negative correlations.

Factor Two in essence was related to the use of simple sentence structures, the avoidance of phrase structures which made little psychological demand on the hearer, and simple personal communications.

Factor Four was related to other types of simple sentence structure and vocabulary.

Factor Five was related to the use of unduly simple vocabulary, restructurings and hesitations.

* * *

CHAPTER VI

DISCUSSION AND CONCLUSIONS

In the last chapter the results of the statistical procedures were presented and discussed.

The purposes of this chapter are to bring together the findings and interpretations, indicate the implications involved and relate them to this field as an area for future research.

To meet these purposes this chapter is arranged to present summaries of the descriptions of the following behaviours: the logical structure of the verbal interaction, the content relevance of these, the purpose and content relevance of teacher explanations, the linguistic structure of teacher monologues, and the style employed. Included in each section are comparisons of these behaviours with pupil achievement and comparisons between the behaviours of experienced and inexperienced teachers, and between secondary teachers and primary teachers.

Finally, the implications of this research are discussed and their significance for future research.

(A) DESCRIPTIONS OF TEACHERS' CLASSROOM LANGUAGE BEHAVIOUR

i. The structure of the classroom verbal interaction

An investigation of the structure of units of the verbal interaction indicated in the questioning behaviours of teachers was undertaken in this research.

The majority of questions used by teachers called for descriptions of some type from the pupils although there was opportunity for incisive inquiry. The secondary teachers asked more questions calling for reasoning and explanations. The experienced teachers, irrespective of form taught, and the primary teachers asked more questions than did the inexperienced teachers and the secondary teachers.

A slight relationship was found between questions calling for explanations, opinions, comparisons and pupil achievement. But there was no strong evidence that pupil performance was directly influenced by the teachers' questioning behaviours alone.

ii. The content relevance of the units of classroom verbal discourse

Most teachers directed discourse so that it was generally closely relevant to the prescribed content. The primary teachers varied considerably between each other in the relevance of their classroom discourse. Few teachers made use of analogous material from pupil experiences. Secondary teachers allowed more expansion of discourse on specific points than did the primary teachers.

The experienced teachers' classroom discourse was more related to the content than was that of the inexperienced teachers. The inexperienced teachers had longer units of discourse than the experienced teachers. The inexperienced secondary teachers made the greatest use of analogous and illustrative discourse.

In those classrooms in which the verbal interaction was restricted closely to content-relevant discourse there was significantly better pupil achievement. Analogous discourse and "free-flowing" non-directed discourse had a negative relationship with pupil achievement.

Although there were indications that shorter units of discourse had an advantageous effect on pupil achievement the evidence was not strong.

iii. The pedagogical purpose and content-relevance of teacher monologues

Teachers varied considerably in the pedagogical purposes of their monologues. A little less than half of the teacher monologues were used for exposition of content material; introductory and summary statements together made up the remainder of the purposes of teacher monologues. Most of the content material was presented by means of discourse.

There was a difference between primary and secondary teachers in the purpose of their explanations. They and the inexperienced teachers used teacher monologues for summary purposes more than did the experienced teachers who used them for expository purposes. Most teachers' monologues were relevant to the lesson topics. Secondary teachers made much greater use of topic-orienting explanations in preparation for the introduction of new content material.

The experienced teachers' monologues used shorter and more frequent explanations and the secondary

teachers had more monologues than the primary teachers.

There was considerable uniformity between the purposes and types of classroom discourse and teacher monologues which demonstrated the part played by the teacher in verbal interaction.

The pedagogical purpose employed by a teacher in his monologues had no noticeable effect on pupil achievement but, as with the teacher questions, the teacher monologue relevance to content made a significant difference to pupil achievement. There was evidence that long teacher monologues had an adverse effect upon pupil achievement.

iv. The linguistic structure of teacher monologues

(a) The teacher lexicon: The majority of teachers used simple vocabulary, the experienced teachers used a higher level of vocabulary than the inexperienced. There was a stronger negative relationship between pupil achievement and low or very high grade level vocabulary than there was where teachers employed appropriate class level vocabulary. However, there was no significant positive correlation between the use of the appropriate level of vocabulary and pupil achievement.

(b) The morphemic structure of teacher monologues: Most teachers used "sentences" of moderate length (8 to 13 words). The experienced teachers in both grades had significantly longer sentences in their monologues than did the inexperienced teachers. Secondary teachers varied considerably between each other on the morphemic structure of their monologues. The use of short

sentences (below 8 words) had a negative correlation with pupil achievement whereas sentences of moderate length had a positive influence on pupil achievement.

(c) The phrase subordination of teacher monologues: Simple sentence structures dominated the classroom language of most teachers. The experienced teachers and the secondary teachers used the more complex sentences. There was evidence that those less demanding, simple phrase structures in classroom language correlated negatively with pupil achievement and the more complicated sentences had a slight positive correlation with pupil achievement.

(d) The phrase structure of teacher monologues: There were marked differences between teachers on the phrase structure of classroom language. The primary teachers used what Chomsky considered the less psychologically demanding structures and the secondary teachers and the experienced teachers used the more demanding structures. There was no positive correlation between the less demanding phrase structures and pupil achievement but there was evidence of a slight positive correlation between the more psychologically demanding phrase structures and pupil achievement. There was a tendency for teachers who employed the more complex sentences to also use the more demanding phrase structures.

v. Style in teacher classroom language

Teachers did not differ greatly in their language style. Most teachers avoided the use of any

form of elliptical structures but teachers did vary in the use of idiomatic expression to reinforce or substantiate their statements.

Certain idiomatic phrases and language markers (such as "now") were used at turning points in classroom discourse and teacher explanations. These are probably verbal signals unconsciously used by teacher and pupils.

The inexperienced teachers used abbreviations of various types, phrasal expressions, and other vague expressions more than the experienced teachers.

Patterns of language style emerged. Although the frequency of occurrence of some traits was low the factor analysis revealed regions of teacher language behaviour in which there was consistent and statistically significant performance.

Three factors were related to simplistic forms of sentence structure, phrase structure, vocabulary and certain other style indices. These were significantly negatively related to pupil achievement.

Lundgren[1] has suggested that in the classroom the teaching process is steered by a certain group of pupils: "This model is built on optimal relations, in which the available time and the capacity of the steering group are fixed values ... We may also see the steering group as static ... If the teacher believes that his task is to get as many pupils as possible to cover as much ground as possible, then the pupils who require the greatest

[1]Ulf P. Lundgren. 1972. Frame Factors and the Teaching Process. A Contribution to Curriculum Theory and Theory on Teaching. Project Compass. Institute of Education, University of Göteborg. Almquist & Wiksell, Stockholm, p. 333.

amount of time, or those next to them, will constitute the steering group. The decisions the teacher must make as a result of this situation then cause a change in the values of the frame factors. The teacher has to lower the goal."

The results of this present research have shown that most of the teachers in these experimental lessons employed simple language components and forms which in general were below the language abilities of the pupils. They may well have been oriented to the language level of the pupil of lower ability or the less linguistically sophisticated. It may be related to Ryle's suggestion[2] that a bright conversational style is employed to disguise any suggestion that the class is working.

vi. Pupil achievement in classroom lessons

The statistical procedures used to analyse the collected language data of the experimental lessons indicated that of the difference in the variance of pupil achievement approximately 37% was attributable to pupil variables such as intelligence, socio-economic status, prior knowledge, etc., and approximately 9% was attributable to the teacher. However, the achievement of the "middle" ability group of pupils was affected by teacher verbal behaviour at over 14%, the "lower" ability group at over 9% and the "higher" ability group at under 9%. This could add substance to the comments above that the teacher's language is set to the linguistic needs of the less able pupils.

[2]Gilbert Ryle. 1968. Op.cit.

vii. Pupil attitudes and achievement

Analysis showed that the teacher generated more interest in the lessons than the lessons did themselves; in "understanding of what is said" and "how much was learned" the results were more attributable to the teacher than to individual differences between pupils. It was concluded that a study of pupil variables such as intelligence, socio-economic status, etc., was the most reliable means of obtaining a prognosis of pupil achievement, but a study of the teacher was the best index of pupil interest, his perception of what he has learned, and ease of understanding lessons. However, these latter three variables were found to correlate highly with achievement.

viii. Future research

This study has provided rudimentary means and methods for studying the linguistic structures of classroom language. No generalisations can be made regarding teacher language nor teaching methods as a result of the study. However, it has been shown that intensive and detailed study of teacher classroom language can be a fruitful field for research in teaching.

* * *

APPENDIX 1

EXTRACTS FROM THE UNIVERSITY OF CANTERBURY'S TEACHING RESEARCH PROJECT'S MANUAL: SYSTEM FOR ANALYSIS OF VERBAL INTERACTION IN CLASS LESSONS 1970 REVISION

1. PART III : IDENTIFICATION OF EPISODES

2. PART IV : CLASSIFICATION OF QUESTIONS

1. IDENTIFICATION OF EPISODES

An episode is defined as all of the class discussion which relates to a significant question or directive. This will include introductory comments leading up to the question, the discussion which is launched by the question, and any terminal remarks or comments which close off the discussion.

Identification of episodes follows the classification of verbal moves. Each occurrence of a significant question or directive is taken as the occasion for an episode. The episode is marked off in the discourse to include all those verbal moves which appear to have been the product of that question or directive. Normally, the episode will consist of all pupil responses to the question and teacher comments on those responses.

Usually, the episode will conclude with a concluding comment or summary comment.

Introductory comments are also included in the episode even though they precede the question or directive.

Repeated, supplementary and subsidiary questions do not signal the beginning of a new episode. They should be included within the limits of some larger episode.

2. CLASSIFICATION OF QUESTIONS

Each of the questions or directives which initiate or give direction to an episode, should be classified into one of the following fifteen categories.

Although subcategories are given in each numbered category, it is not necessary to make subcategory distinctions. The subcategories are provided for illustrative purposes, and make rather more subtle distinctions than are thought necessary in classifying questions.

1. Defining

   1.1 Give the meaning, definition, or use of a term.

   1.2 Tell what a term refers to.

   1.3 The meaning or use of a symbol or short-hand term.

2. Describing

   2.1 Tell what is (had, has) happened, what is (has) taken place.

   2.2 Describe or tell about some thing or event.

   2.3 Tell what something, or someone, did, was doing, or what was done with something.

   2.4 Tell what something is like in form, appearance, shape, colour, etc.

   2.5 Tell what are the properties, characteristics, uses, functions, purposes, aims, of something, or what it is made of.

   2.6 Tell where something is, where is it found, where does it come from.

   2.7 Tell when something happened, what time it occurred.

   2.8 Give a measurement or arithmetic value for something.

   2.9 Is some claim about existence, occurrence, etc. true.

3. Procedural Description

3.1 Question asks how a person does (did, would, should) perform a specified action or obtain a particular result.

3.2 Question asks for a particular (e.g. next) step or part in a procedure or method for doing something.

4. Giving Examples

4.1 Giving examples or types of things which belong to some class or category.

4.2 Listing or naming all of the parts, components, or types that make up a thing, or class of things.

5. Naming

5.1 Something is described or specified by location characteristics, etc. and its name is asked for.

5.2 The name of someone or something is asked for.

6. Stating

6.1 A decision, statement, inference, conclusion, etc. made by someone else, is asked for.

6.2 A formula, rule, equation, or theorem is called for.

6.3 An answer, solution, conclusion reached by a pupil, or the class, is asked for.

7. Exercises

7.1 An answer or solution is called for, to be worked out in class, to an arithmetical calculation or other problem or exercise.

7.2 Mathematical and calculational processes are called for, e.g. substitute in formula, simplify, etc.

8. Reporting General

8.1 Asks for report of what is said in book, document, text, film, etc.

8.2 Asks what happened, was concluded, etc. as summary or report of previous class work.

8.3 Asks what person addressed found out, where he found out, where the information comes from.

9. Personal Reporting

9.1 Asks how the person addressed feels (felt), whether he understands (understood), what he is thinking of.

9.2 Asks about the experience(s) and perceptions of the person addressed.

10. Evaluating

10.1 Asks whether an individual, group, policy, practice, decision, feeling, etc. is right, just, good, proper, fair, worthwhile.

10.2 Asks whether something is valuable, important, prized, interesting, fascinating, etc., or which of several is most important, valuable, etc.

10.3 Asks whether an operation, procedure, argument, statement, assumption, conclusion, is adequate, satisfactory, true, logical, safe, etc.

11. Opining

11.1 Asks for an inference about what someone or something might be like, have been like, feel, have felt, have done, etc.

11.2 Asks for an opinion about whether something is possible or not, is necessary or not.

12. Classifying

12.1 An instance or example is given, and the class, group, or kind to which it belongs is asked for.

13. Comparing and Contrasting

13.1 Two or more things are specified and the differences and/or similarities between them are asked for.

13.2 An object or event is specified, and something similar to it, or different from it, is asked for.

13.3 Two things are specified and the relationship between them is asked for, or it is asked if they are the same (kind of thing).

14. Conditional Inferring

14.1 A need, state of mind, personal condition, etc., is given, and a request is made for what a person (one) would feel, do, ought to do, like to do, etc.

14.2 Some antecedent state of affairs is given, and a request is made for what would happen, what the effect might be, what the result or outcome could be.

Note: Simple arithmetical or other problems performed as exercises in the class should not be put in this category.

15. Explaining

15.1 A cause or reason is asked for, and the answer required is some physical or empirically justifiable antecedent state of affairs.

15.2 An event or state of affairs is mentioned, and a request is made for what led up to, or what sequence of events or actions led up to it.

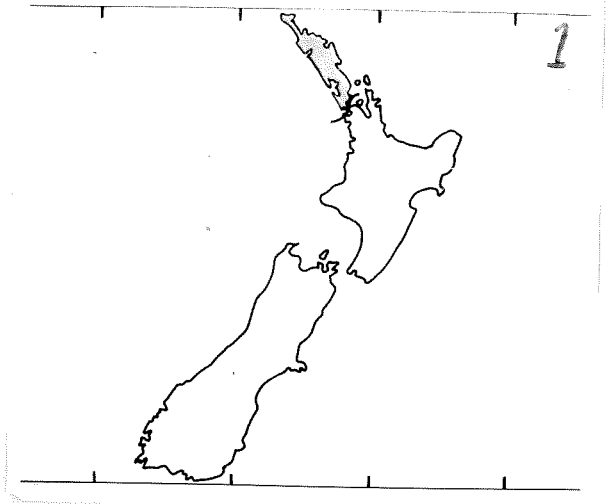
15.3 The question asks why something exists, is important, is a problem, why it is used, neglected, etc.

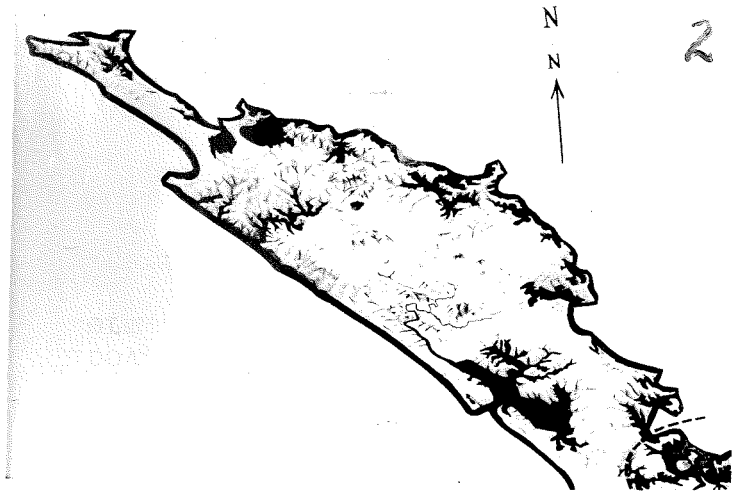
15.4 Some thing, action of a person, social institution or practice is mentioned, and it is asked why this exists, occurred or is done. The reason requested is some purpose, aim, intention, desire, need, etc.

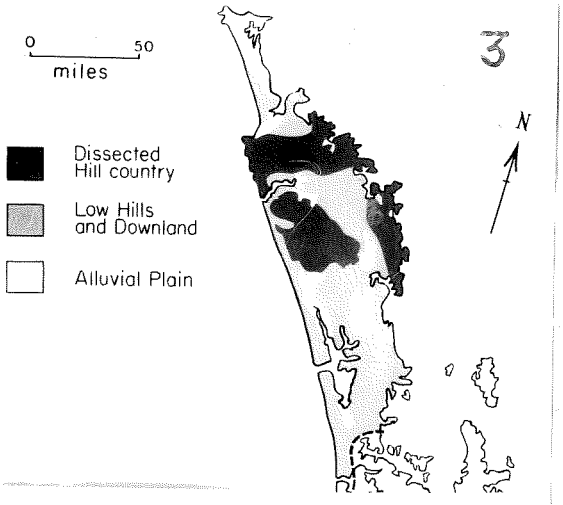
15.5 Some classification, use of a name or title, conclusion, or argument, is mentioned, and the question asks for some justification or logical support for it.

15.6 Question asks how does someone know that something is the case, that something has happened, etc.

Appendix 2: Pupil Booklet (reduced by $\frac{1}{3}$).







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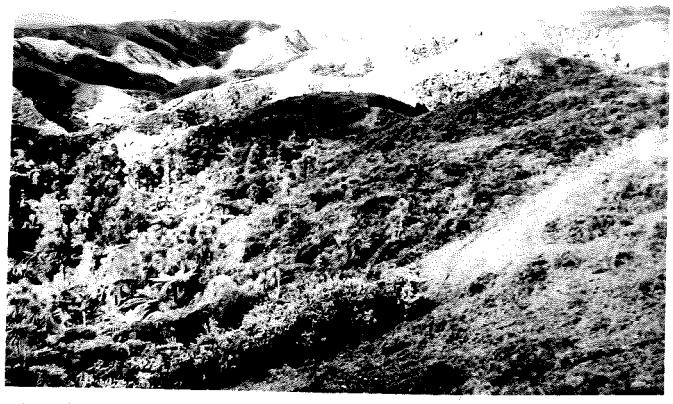

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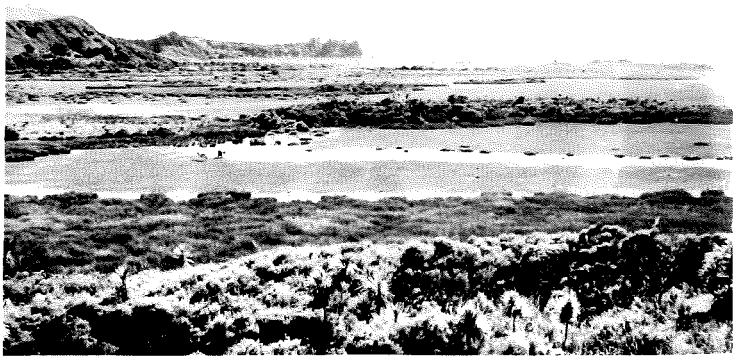

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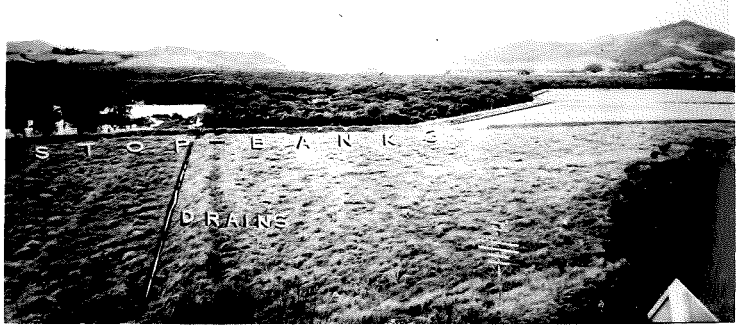

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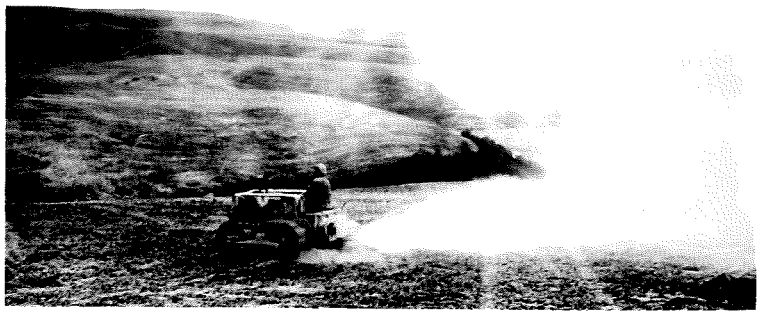

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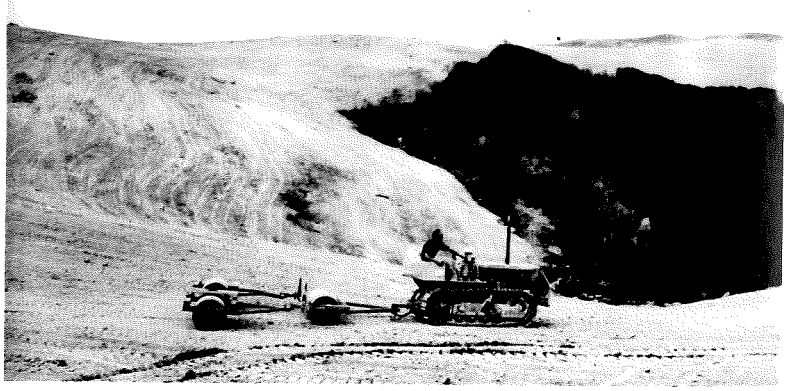

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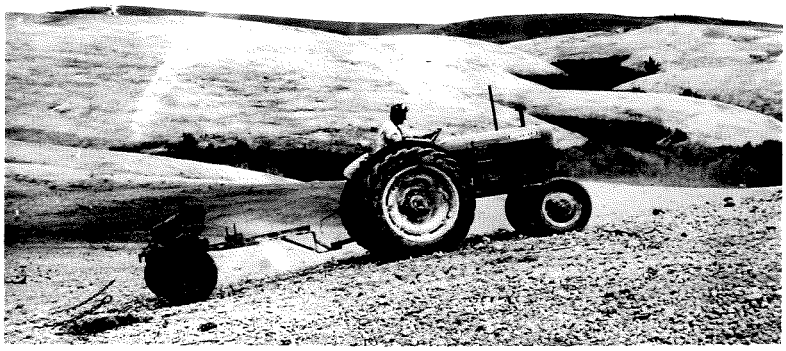

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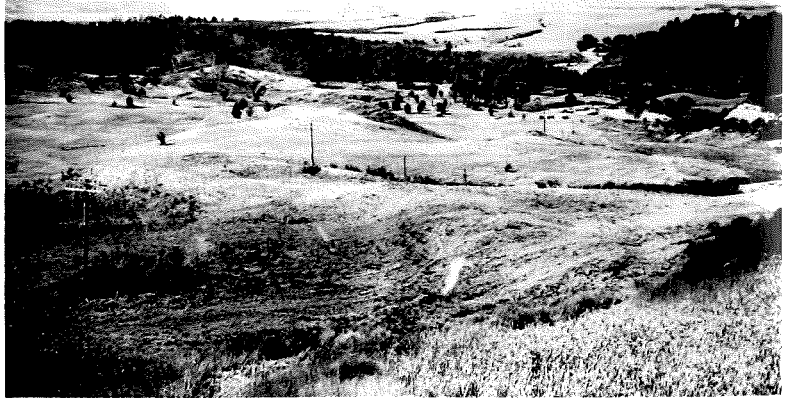


APPENDIX 3

TEACHER'S NOTES

EXTRACT FROM MAYHILL AND BAWDEN:

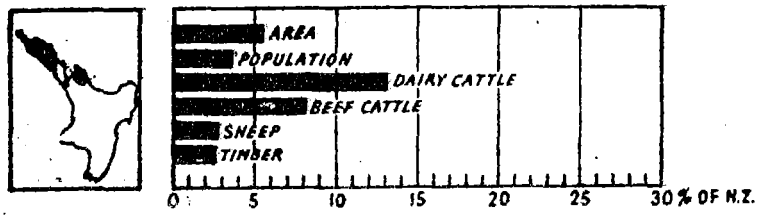
NEW ZEALAND GEOGRAPHY

CHAPTER XIII : NORTHLAND

NOTE: THE MARKED PARAGRAPHS ARE NOT DIRECTLY RELEVANT TO THE CONTENT OF THESE LESSONS.

NORTHLAND

Recent Development



(Figures include Coromandel)

FIG. 63. NORTHLAND: LOCATION, AREA, POPULATION AND RESOURCES

Setting

Relief: A narrow peninsula, with ria coastline—the east with sandy beaches and rocky headlands. Straight west coast has iron sands.

Mainly hill country with lowlands limited to river valleys and coastal flats. Recent and ancient rocks, sedimentary and volcanic, give landform variety.

Climate: "Sub-tropical" sunny, maritime, abundant rain, with winter maximum, mild winters, and warm humid summers.

Whangarei

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
T°	63	64	62	58	54	50	48	49	52	55	58	62	56
R"	4.7	3.7	3.7	5.7	7.3	7.4	7.7	6.2	5.1	4.7	4.1	3.6	63.9

Vegetation and soil: "Sub-tropical" rainforest remnants on the rugged wet ranges. Podocarps on the leached acid soils of the hilltops. Broadleaf hardwoods on the warmer more fertile clays and volcanic loams of the lower slopes. Mangroves on the tidal mud flats.

History: Early Polynesian and European settlements —missions and trading posts. 1840: Treaty of Waitangi. Peak of short-lived political importance. Ruthless exploitation of whales, flax, timber, and kauri gum. Stagnation followed. Isolated farming survived in a desolate wilderness. Rapid progress since the Second World War.

RECENT DEVELOPMENT

Well-kept farms, thriving towns, and sealed roads, give little indication that much of Northland's prosperity has been won in the last 25 years. Despite its early development a variety of problems deterred settlers. The relatively high density of Maoris made land purchase difficult, and relations between the two races were no easier here than in other parts of New Zealand. Heavy bush covered the hills, the small lowlands were swampy, and the infertile soils were difficult to farm. Communication was difficult, roads in winter became "seas of mud", and trips by coastal vessel frightened all but hardy sailors.

The removal of the seat of government from Russell, first to Auckland and later to Wellington, increased Northland's isolation. With the development of extractive industries, particularly timber and gum, a "Wild West" atmosphere developed, which tended to discourage the less adventurous settlers. Northland's wealth was taken out of the region and little put back, for settlers turned to other areas where land was easier to purchase and civilisation less remote. Progress before the Second World War was slow. Since then, however, the economic picture has changed, farm production has risen rapidly, population has increased and secondary industry has won national significance.

LAND USE

Today, Northland is a major livestock farming region, where the advantages of a mild, humid climate and the resultant all-year grazing, offset the often poor and varied soils. Cattle make up 70 per cent of the livestock units, and dairy cows 30 per cent—these latter providing most of the total farm income.

Dairy farms are sited on the best land—the river and coastal flats, near Kaitaia, Whangarei, Towai, and Dargaville, the yellow-brown clays of Kawakawa, and the fertile volcanic loams of Kaikohe, Ohaewai, and Kaeo (Northland Location map). On some farms in these select areas, production figures equal those of the Waikato and Taranaki, but overall, regional output per cow and per acre is far below national averages. In many cases, farms are

too small to be efficient, resulting in poor pastures, inferior stock, and low carrying capacities.

The mild climate, however, ensures a bare living with a minimum of effort. In far too many areas, the farm landscape has long been one of unpainted buildings, tumble-down fences, rush-infested swamps, and vast expanses of manuka, blackberry, and bracken. Until recently, hay and silage have been relatively unimportant, since pasture growth continues for most of the year, and rough hill country has been readily available as "run-off". (Land Use Fig. 64)

An agricultural revolution is now taking place in Northland. Although some of the increased production is coming fron new land, much stems directly from better farming methods—improved stock breeding, greater use of fertiliser, hay and silage, and also the sale of many uneconomic holdings to successful local farmers. Today, half the region is in grass.

The following study of a farm in the Mangakahia Valley, 25 miles west of Whangarei, well illustrates the problems and recent development in the region:

1947: A farm of 175 acres was taken over by brothers. 140 acres of this was swampy river-flat, subject to flooding. It had only one fence and the herd of 68 cows had to be "mustered" for milking as the tall fescue and scrub actually hid the cattle. Production was only 16,000 lb butterfat per annum.

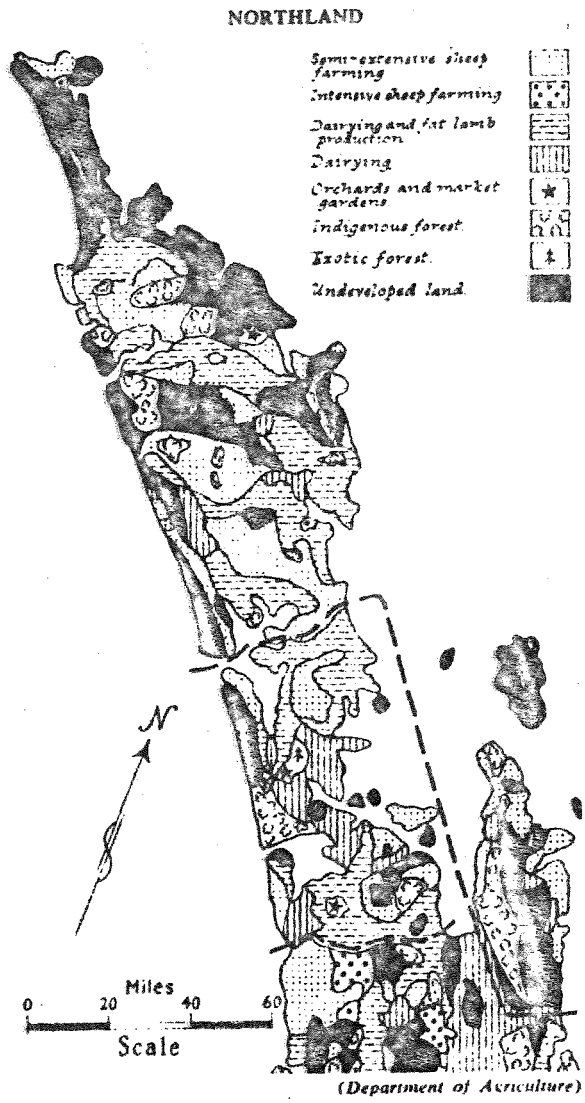


FIG. 64. NORTHLAND: LAND USE

1948: (a) Home Farm Improvements

(1) A half-mile canal was dug to 16ft to drain the flats.

(2) Rushes were dug by spade and hauled out by horses.

(3) Cows were inoculated against disease; the herd was built up to produce 30,000 lb butterfat.

By 1958 (4) A central race was put in, and the farm was subdivided into 10-acre paddocks.

(5) A jet pump replaced the bore and petrol pump to provide water even when the river was in flood. A reservoir on a 40ft knoll and

reticulation to all paddocks followed.

(6) Molybdenum and superphosphate improved the pastures.

(b) Run-off: A block of 220 acres of scrub-covered hills was bought to winter the stock, in order to save the home farm from poaching.

(7) Boundary fences were built, the scrub was burnt off, and the land was aerially topdressed and sown.

In 1965, 170 cows were milked giving 54,000 lb of butterfat. 18 sows each produced two litters of baconers. A new herring-bone shed was built to reduce milking time. Although one man was employed an acute labour shortage existed, necessitating change over to tanker collection. $2,000 piggery was abandoned.

N.B. All improvements came from actual farm income and unceasing hard work on the part of the two owners.

On steeper hill country, dairy cows give way to sheep and beef cattle, which are regarded as complementary. Here, high rainfall totals make cattle essential if rough grazing is to be controlled effectively. Farms vary in size, but tend to be smaller than similar holdings in the western hill country and Eastland—often running only 500 head of sheep. Relatively little sheep or cattle fattening is attempted in the region, and lambing averages, except in the southern half of the region, are below the national average. Chapter 10 gives a description of this store stock farming, and includes a plan of a Northland hill-country farm.

As new land is being developed and carrying capacities rise, beef and sheep are growing in importance. Even some dairy farmers on marginal country are switching to this form of land use, since overseas dairy markets remain uncertain.

Northland has a rapidly improving pastoral economy, one in which the dominating role of dairying is being challenged.

SUB-TROPICAL CLIMATE AND CROPS

The climate is unique. This is one of the outstanding characteristics of Northland, and helps to explain some of the successes and problems of its land use.

Northland gets rain throughout the year, but there is a marked seasonal rhythm, for one-third falls in the winter months, and only one-fifth in the hot summer. (The climate is explained in Chapter 5, see especially Fig. 15.) During the summer the farmer faces the possibility of drought, and for this reason paspalum and kikuyu grass have been introduced to provide feed when other grasses have become brown and dried.

Another serious hazard is the occasional tropical cyclones in late summer, which bring gale-force winds and tremendous downpours, causing valleys to flood and roads to be blocked by slips.

The climate is characteristically humid, sunny (2,000-2,100 hours p.a.) and warm. Other areas of New Zealand, particularly those in the lee of the westerlies, have higher summer temperatures, but nowhere are winters as mild. This gives Northland the highest mean annual temperatures, and the lowest annual range (as low as 12°F in the Far North), in the country.

The popular expression, "the winterless north", is a relative term, for frosts do occur on calm nights when cold air drains into the sheltered valleys, as in the protected citrus groves of Kerikeri.

Nevertheless, plant growth is almost continuous, and this warm climate can support sub-tropical crops. Maize is cropped and exotic plants, including bananas, may be found in the north. The only commercial plantations, however, are 650 acres of citrus orchards at the head of the Kerikeri inlet, Bay of Islands. Sub-tropical fruits, mainly chinese gooseberries and tree tomatoes, are sometimes planted between the rows of citrus trees, and even the hedges themselves may be fruit-bearing feijoas or passionfruit.

There is little doubt that selected areas of Northland could grow a great variety of exotic crops, although the remains of an ill-fated tung oil experiment bear witness that more is needed than imagination and hard work.

LAND USE PROBLEMS

Perhaps the most striking characteristic of Northland is the patchwork pattern of land use which reflects the complexity of relief, rock type, and soils. Development of wasteland, however, is proceeding rapidly. Almost half the loans issued by the Marginal Lands Board in 1964-5 went to progressive Northland farmers. 700,000 acres await development.

Drainage

Even some of the most fertile country, for example the Ruawai flats, has needed extensive drainage. Further effective drainage could increase production by almost half a million acres. Shallow, mangrove-covered tidal areas also have a high potential once the problem of salt has been overcome. Excellent pasture has been established on such land near Whangarei and Mangonui, and there are further possibilities on the Kaipara, Hokianga, and Whangaroa mudflats.

Sand Dunes

Belts of moving sand (160,000 acres) stretch the full length of the west coast, and extend across parts of the narrow peninsula north of Kaitaia (the Far North). They threaten to engulf developed lands, and indeed, over a period of forty years, have buried a complete farm on the North Head of Hokianga Harbour. Where the sands have been stabilised, as in the area to the west of Dargaville, dairying is

practised. Elsewhere, the first problem is to stop the drift by planting marram grass and trees. The sands have already shown a considerable potential for forestry and they can make an important contribution to the region's prosperity.

Gumlands

Severely leached gumlands, with little natural fertility, occupy more than 800,000 acres. Machinery, technical knowledge, and capital are required, and here the State has played a major role in grassing large blocks and then subdividing them into individual holdings (Plate 50). The gumland clays are difficult to drain, and fertilisers have to be used lavishly. Nevertheless, in spite of some disappointments, dairy cows, sheep, and beef cattle are being farmed successfully on many of these former wastelands. Private companies are also reclaiming land.

Ironstones

Severe leaching is also a feature of the Bay of Islands ironstone soils. A layer of ironstone (limonite), varying in thickness, may occur anywhere from the surface to depths of 18 inches. Where the topsoil is reasonably deep, and stones allow free drainage, good pasture is possible, but large areas still carry scrub and further development will be costly.

Maori Lands

Maori land infested with scrub and weed is a source of

irritation to neighbouring farmers, whose properties are fully developed. The problem is aggravated by communal ownership, which complicates the clearing of land titles.

Where such land is in use, dairying on small 15-40 acre holdings is characteristic. The low production figures on these farms partly explains the low regional figures already mentioned. Europeans have acquired most of the better areas, and Maori land tends to be marginal country, difficult to farm even if capital is available. The Maori exodus from Northland has to a considerable extent been an escape from such farms.

Since the Maori Affairs Department became responsible for land development there has been an improvement, and today, efficient and prosperous Maori farmers are to be found in all counties.

Little more than 400,000 acres of the original forest cover remains today, and most of this is on remote and steep mountain blocks, such as the Tutamoe, Maungataniwha, and Coromandel Ranges.

Some attempts have been made to re-establish forests using native species, but, as has been found in other parts of New Zealand, various exotics offer a quicker financial return. Plantations established in the 1930s now provide almost two-thirds of Northland's timber. Forestry is expected to make an increasingly important contribution to regional prosperity, especially from problem areas such as

gumlands, sand dunes, and ironstone soils, which are better suited to trees than grass. The Forest Service has successfully established plantations on some of these soils, and it plans to maintain an annual planting rate of at least 1,000 acres.

POPULATION

Northland is a small region, with only 3 per cent of the total population. Early settlement clung to the bays and inlets of the long coastline and for many years, centres of population such as Russell, Whangarei, Dargaville, and Waipu were isolated from one another by rugged hills and desolate stretches of fern and scrub. Despite improved communications, which attracted settlement away from the coast, two-thirds of the population was still peripheral in 1961.

The Northland population structure has three rather unusual characteristics. First, a high proportion of males, particularly in the western counties, which have had a long history of timber industries. Second, partly through the high birth rate among Maoris, a large proportion in the lower age groups; and last, a cosmopolitan nature, which is not as evident today as it was. In the past, small groups of various European nationalities—the Scots of Waipu, the Bavarians of Puhoi, and the Dalmatian fishermen and gumdiggers—all preserved a national identity: but today they have been absorbed into the community. One-eighth of the Maoris of New Zealand live in Northland and this figure represents a quarter of the total regional population of 84,000. The

Maoris remain predominantly in the four northern counties despite a drift to the cities. Two out of every three people (more than double the national figure) still live in rural areas. This is a reflection of late development. Recent urbanisation is changing this and already, Whangarei has a quarter of the total regional population, and within twenty years it may have over one-third.

INDUSTRY

Extractive industries, which once made this the most prosperous region in New Zealand, have declined in importance. Gum-digging and coal mining are now of little significance. Gone too are most of the busy little mills of the Hokianga and Northern Wairoa, which cut down much of the rainforest. The surviving mills are still small and dispersed, and the emphasis has changed to logging the pine plantations.

The decline of extractive industries encouraged the growth of pastoralism, and today processing of farm products is prominent. Dairy factories, for example, contribute 15 per cent of New Zealand butter, as well as other milk products; and the only freezing works at Moerewa, exports 10,000 tons of meat a year.

Whangarei (27,600), nestled between the Western Hills and Mt. Parahaki (794ft), has a beautiful setting at the head of a long estuary (Whangarei Topographic map). It is one of New Zealand's oldest towns, but newest cities. Its luxuriant

parks, flowers and trees give it a mature, almost sub-tropical look, worthy of the title, "City of the North".

It dominates the north, for it has no rival as a regional capital, or as a commercial or industrial centre (Plate 51). Nearby are old-established cement and brick works. Portland produces 250,000 tons of cement a year, 40 per cent of the national output. The cement is bulk-handled, and piped direct from silo to ship or pressurised road tanker. Kamo produces high-quality refractory bricks.

The newer industries—clothing, printing, engineering, construction, as well as some spectacular heavy industries, best illustrate the change that is taking place in Northland. On new Harbour Board land near the port of Whangarei, are the large glass works, cool stores, and fertiliser works which use serpentine from Kerr Point and imported rock phosphate.

To the south is Marsden Point, the only oil refinery in New Zealand, producing petroleum, diesel, bunker oil, and bitumen from imported crude oil. Planners hope that other industries will be attracted to the Whangarei area—the only industrial centre north of Auckland. This also is the site of an oil-burning power plant.

Development in industry has been very recent and very rapid. The Whangarei Harbour Board has played an important part in this, by converting mudflats into valuable industrial sites and by improving the port. Firms seeking room for expansion have been offered favourable terms. Here too, is a

surplus of labour, particularly of Maoris, who have moved to the town away from the depressed rural areas.

There is little hope, however, for industrial expansion in the small towns, where there is an acute shortage of employment. Commercial fishing has always been on a small scale, but there are experimental oyster farms on the Kaipara and near Warkworth where shellfish are grown on wooden racks. Dargaville (Tikinui) and Ninety Mile Beach (Waipapakauri) have little toheroa factories, while Whangarei and Whitianga (Coromandel) export crayfish tails.

Northland is fortunate in the variety of rocks and minerals available. Not only is industrial limestone widely distributed, but the volcanic rocks contain such minerals as copper, iron, manganese, and mercury. The weathering of basalt lava produces a great variety of clays, some of which have firebrick and kaolin properties for the making of bone china. In these, perhaps there is a potential for further development.

TRANSPORT

The pattern of transport has varied with the changing economy. Shipping, all-important until the turn of the century, has since declined. However, isolated timber ports such as Awanui, still rely on coasters, and some bulky materials are still moved by ship. Silica sands, for example, are sent from Parengarenga to Whangarei, and bulk fertiliser and cement are shipped out of Whangarei Harbour.

Opua, the long-time rival of Whangarei for the title "Port of Northland", handles meat and dairy produce, but the growth of new industries has strengthened Whangarei's claims. The new oil refinery has in fact given Whangarei a greater cargo tonnage than any other port in the country.

With the expansion of farming, good land transport became an important issue. The region still does not have adequate rail services, but these are unlikely to be extended to the northern areas, in view of the limited traffic.

For a long time poor roading limited agricultural development. Major roads are now satisfactory, but back roads are still often narrow, winding, poorly surfaced, and inadequately bridged. The secondary roads are the concern of local councils, but they lack the finance to make the necessary improvements. High freight costs on livestock and manure still frustrate the hill-country farmer.

The region suffers from being "out on a limb", as far as main trunk air links are concerned. Even the Kaitaia-Kaikohe-Onerahi route is a mere feeder service, with limited terminal facilities and flight schedules.

Inadequate transport has been a major handicap to the progress of Northland, and the problem has not yet been completely solved.

TOURISTS

No other region has such a wealth of historical

associations, and such a variety of beaches. Evidence of Maori settlement is widespread, and all who wish to know something of early European contact with New Zealand must visit the Bay of Islands and Hokianga. The unique kauri forest of Waipoua and Trouson Park are a further attraction. Since Zane Grey made Otehei Bay famous for deep-sea fishing, sportsmen from all parts of the world have come, hoping to emulate his record-breaking feats.

The popular term, "Winterless North", has an almost magical significance for many southern visitors. Northland may lack the grandeur of alpine scenery, but no other region can match the beauties of its eastern coastline. Golden bays, fringed with the red pohutukawas, and the excellent boating and swimming opportunities help fill the motor camps and motels in summer. Many of Auckland's urban half million own baches on beach frontages, as far north as Doubtless Bay. The needs of the touring public are now being met, and luxury holiday accommodation, such as that provided by the Waitangi Hotel, is evidence of the growing importance of the tourist industry in Northland (Plate 52).

SUMMARY

Northland peninsula, with its warm summers and mild winters, its proximity to the sea, its bays, rocky headlands and sandy beaches, has a character all of its own. No region has a longer history of Maori and European occupation, and also, of subsequent neglect. Few have progressed as rapidly in recent years.

Today, with improved communications, it is becoming a fairly closeknit region, ending a long period of isolation and frustration.

Northland has considerable resources, an excellent climate for pastoral farming, a potential for mineral production, and a variety of tourist attractions. Here lie its greatest prospects.

Many of the peculiar problems of climate, soils, varied terrain, and fragmented land titles have yet to be solved, but already there have been spectacular successes. In the last ten years Northland has seen a 12 per cent increase in butter production, a 100 per cent increase in sheep, and a 115 per cent increase in the wool clip.

The Whangarei industrial node is likely to grow, and continued urban drift may expand this primate city of the north into one of New Zealand's main towns. With increasing primary production, and rising oil imports, Whangarei has already become a major port in terms of cargo tonnage.

Northland is a land of promise—a land of recent development. It has had an exciting past and is assured of continued progress.

APPENDIX 4

NOTES TO TEACHERS

AN EXPLANATION AND OUTLINE OF THE RESEARCH INVESTIGATION FOR HEADMASTERS AND TEACHERS

CLASSROOM LEARNING RESEARCH

Study No. 7

Language and Learning in Form II and III Pupils

We are currently engaged in the seventh of a series of research studies concerned with pupil learning during ordinary classroom lessons.

This series of studies started over ten years ago, when we made our first tape recordings of typical class discussion lessons in three Christchurch Intermediate schools. Since that date, we have been helped tremendously by the headmasters and staffs of many Primary and Intermediate schools in Christchurch and have been able to carry out research studies in about 20 Standard Two classrooms, about 10 Standard Three classrooms, about 60 Standard Four classrooms, and an equally large number of Form I and II classrooms.

The amount of data which has been collected is enormous. We now have a great deal of information about how children participate in class discussions and how they learn from this participation. But classroom teaching is a complex activity, which varies considerably from class to class, from time to time, and so on. There is still a need for further data.

The present study is concerned with the use of language in the verbal interaction of teacher and pupils

during class lessons. The field work (obtaining of tape recordings, administering tests, etc.) is being carried out by Mr Norman Daniels as part of his M.A. thesis research study.

What we would like to obtain are tape recordings of sets of social studies lessons in eight Form II classrooms and eight Form III classrooms. These tape recordings will be transcribed and the language used by teacher and pupils analyzed and related to measures of the pupils' ability, prior knowledge, and learning.

In order to standardize the situation, so that the lessons recorded in each classroom will be comparable, we have prepared an outline of a topic on Farming in Northland, with a supply of teacher resource materials. Teachers who are willing to participate in the study will be asked to teach this topic over three thirty minute lesson periods.

The participating teachers are free to present or teach the topic in any way they find convenient and appropriate. The only restriction we would like to impose is that the topic be presented and/or discussed in class only during the arranged lesson periods. This is to ensure that the pupils in the different classes have exactly the same amount of exposure to the material.

It should be emphasized that this is not a study in which teachers or teaching methods will be compared with

each other. The tape recordings which are made, and the pupil test results which are obtained, will be kept strictly confidential.

Copies of test results will be made available for the participating teachers if they want them. A report of the results of the investigation will be given to each teacher when the work is concluded. This latter report and any other research reports will not specify the names of any schools, teachers, or pupils mentioned.

The Programme

The following is the programme of activities which would be involved in any one class. Five periods of approximately half an hour are required.

Period 1: (a) Short test of prior knowledge (15 minutes).

(b) First introductory lesson period (20 minutes).

Period 2: Second lesson period (30 minutes).

Period 3: Third lesson period (30 minutes).

Period 4: Testing period including:

(a) Social Studies Attitude Test (10 minutes).

(b) Children's Associative Reasoning Test (20 minutes).

Period 5: Achievement test (memory for Northland Farming topic material) (20 minutes).

The times for these periods can be arranged to fit in with normal timetable arrangements. It is hoped that

periods 1 - 4 can be arranged for successive days, and that period 5 can be fitted in about one week after period 3.

Teacher Resource Materials

The following will be supplied:

(a) Outline of the topic

(b) Resource notes for the teachers

(c) A set of booklets for pupils containing postcard size pictures and maps

(d) Wall charts for teachers. Hand-drawn illustrations of the plates and maps in the pupils' booklets.

Care has been taken in the preparation of the outline and resource materials. An experienced senior Social Studies teacher who has taught in both Primary and Secondary schools, and participated in the development of the new Social Studies curriculum, was consulted.

Recording

The primary purpose of this study is to obtain tape recordings of class discussion lessons. We have now had considerable experience in using tape recorders in classrooms, and have developed methods of recording which create a minimum of disturbance or distraction to pupils. Our experience has been that pupils adapt quickly and come to ignore the presence of the microphones and the recorder and operator.

The presence of Mr Daniels, in the classroom, to operate the recorder will be necessary if the record of

pupil participation and language is to be a complete one.

Final Note

We understand that teachers who are willing to participate will be involved in some extra work. For some teachers, the idea of covering a specific topic within a three period time limit, will be an unusual method of handling social studies material. And there may be other problems involved in fitting in with normal timetables.

As far as possible we have attempted to plan the topic and materials so that they can be used with little disruption to normal programmes. But there are unavoidable difficulties involved in trying to standardize conditions across Intermediate and Secondary schools.

It is our belief that this study will provide valuable knowledge about pupil learning in classroom settings, which will ultimately by of considerable practical value to teachers. In conducting this research, we must rely on the goodwill of the teachers who agree to participate. We are grateful for the willing assistance we have had in the past, and hope we can continue in this cooperative effort.

Graham Nuthall
Senior Lecturer in Education
University of Canterbury.
'Phone 65-819, Ext. 822.

Norman Daniels
Hillmorton High School.

APPENDIX 5

TOPIC OUTLINES FOR TEACHERS

1. LETTER TO TEACHERS

2. A SUMMARY SHOWING SUGGESTED SEQUENCE OF TOPICS WITH CORRESPONDING REFERENCES TO THE PUPIL BOOKLET AND WALL CHARTS

C/- Education Department,
University of Canterbury,
Christchurch.

Dear

I enclose information and materials for the research lessons.

In order that standardization can be obtained between the form of the lessons given by different teachers I would ask that you follow the lesson plans as given on the page entitled 'LESSON PLANS'. This gives the main topics and order to the lessons but the treatment of content within this framework is entirely up to each teacher. This also applies to the divisions between lessons.

You are asked not to give written exercises during the lessons nor homework on the topic, please.

The tests in periods 1, 4 and 5 will be given by me. In lesson 1 I would need about 15 minutes for the test before you give the introductory lesson of about 20 minutes. Periods 2 and 3 would be each of the normal classroom lesson time. Period 4 - If you would prefer to have a "non-teaching period" while I am conducting the tests I would be quite happy but you may wish to remain with the class. Period 5, if possible a week after period 3, would take only about 15 minutes.

There is one set only of the 'teacher aid'. These are

hand illustrated copies of the plates in the pupil booklet but on heavy 45" x 30" white card. They are hung on a blackboard easel which I have prepared and will bring.

I am most grateful for the willing cooperation you have shown and look forward to working with you.

Yours faithfully,

Home Address: 204 Dyers Pass Road. 'Phone: 31-723.

Topic Outlines	Pupil Booklet & Wall Chart Plate Numbers	Wall Charts: Types	Wall Charts: Texts
Location of Northland	1	None	
Setting of Northland			
(a) Relief	2	Illustrated (black and white only)	Peninsularity
(b) Land form and types of farming.	3	Illustrated (2 colours only)	As on plate.
	4	Illustrated	Low hill and downland country.
	5	Illustrated	Contrasts in landscape (Labels: Dissected hill country. Downland.)
Land Use Problems			
(a) Sand encroachment	6	Illustrated	Encroaching sandhills on the margin of the Hokianga Harbour.
Control of the sand.	7	Illustrated	Control of sand in coastal areas.
(b) Leached soils - gumland	8	Text only - no illustration	Large areas of poor gumland are covered with scrub.
(c) Leached soils - ironstone soil	9	Text only - no illustration	Scrub and bracken on undeveloped land on the ironstone country.
(d) Drainage problems in low tidal areas.	10	Text only - no illustration	Undeveloped tidal swamp on the Kaipara Harbour.
(e) Drainage in low tidal areas - mangrove swamp.	11	Text only - no illustration	Mangrove swamp at high tide. These areas are very low lying.
Solution - drainage and reclamation.	12	Illustrated	Reclaimed pasture (Labels: Drains. Stopbanks.)
Forestry and Conservation	13	Illustrated	Forests of Kauris and other native trees.

Topic Outline	Pupil Booklet & Wall Chart Plate Numbers	Wall Charts: Types	Wall Charts: Texts
Development of Marginal Land	14	Illustrated	Development of marginal lands.
	15	Text only - no illustration	After clearing the land is disced. In hilly areas machines which distribute lime and fertiliser are used.
	16	Text only - no illustration	Depending on the type of soil, at various stages the land is rolled.
Seed sowing	17	Illustrated	The prepared soil is sown with grass seed.
Aerial topdressing	18	Illustrated	Aerial topdressing on established pasture on Northland hill country.
Developed Farmland	19	None	

APPENDIX 6

SAMPLE TAPE TRANSCRIPT

would you think these holes might have come from up in Northland? What would they have been digging for do you think perhaps, in Northland? Jeannie?

81. 9. P: Gum.

82. T: Gum, yes. If you ever fly over Malaya, which is going a few thousand miles away, if you ever fly over Malaya and look down you'll see nothing else but jungle but in the jungle you'll see lots and lots of big, great big holes and this is where they've been excavating for tin. And if you went to South Africa you'd find these huge holes, great clay outcasts, and I suppose that would be where they've been looking for things like diamonds or um, ah, other minerals. If you go to Northland you'll find a lot of holes in the land up there and this is where they - in the past they've dug for gum.

Now when you open up holes, a lot of rain, what do you get happening to the soil?in those holes?

83. 1. P: Goes all mushy and it ah, the water sinks through into the other soil.

84. T: That's right and this is what we call - the soil becomes leached.

Now I wouldn't worry too much about this word leached but the rain goes through the soil and in the soil there are valuable minerals. Don't worry about this. Don't hope to know what the minerals are or anything like that. In fact I don't even, not sure what the minerals are myself but the continual rain on these places where man has dug these gum holes, gradually leaches the soil and washes away these minerals and the soil becomes what we call (WRITES ON BLACKBOARD) infertile. In other words it becomes very poor soil.

Now what do you think would be a very good way of raising the fertility, making that soil better? How could they ah, improve the soil? How would you improve the soil on your farm? Very poor soil. How would you go about improving it? Pamela?

85. 13. P: I'd plant a crop of peas.

86. T: Why, why would you plant ah peas?

87. 13. P: Um because um, peas put in um, I think it's nitrogen or something like that into the soil.

88. T: That's a good answer, yes, that's right. These little nodules of nitrogen yes. Ah what could we call this nitrogen? Would we have a name for it? Come on.

89. 30. P: Fertiliser.

90. T: Fertilisers, that's right. Use a lot of fertilisers in the soil. (WRITES ON BLACKBOARD) That's another picture, all the sand in the coastal areas. No. 7 on your chart. ...

No. 8 on your chart shows a picture of some gumlands covered with scrub. Scrub usually grows on poor soil and of course if you've got a lot of scrub on your land it's very difficult to clear it, difficult to clear it away (so you could) fertilise or top dress your soil.

Now um, you have a look on your No. 1 map, going back to the sand. Most of the sand is on the west coast of um, the Northland peninsula. Can you all see which is the west coast? Which do you think would be the west coast? Can you show your neighbour? Is that the straight side or is it the rugged side, the Bay of Islands side? Mark?

91. 10. P: The straight side.

92. T: Yes, that's right. That's the iron - that's the um sand side. On the east coast we've got ironsands running through the ah, structure there and ah, this makes drainage pretty t - pretty difficult.

Now, have a look at um, picture No. 9. That's your ironsands, ironstone country, on the east coast Bay of Islands. And No. 10 is your tidal swamp on the man - on the Kaipara Harbour. Now these swamps - what do

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7.

would you think these holes might have come from up in Northland? / What would they have been digging for do you think perhaps, in Northland? Jeannie? | CE-1 5·2

81. 9. P: Gum.

82. T: Gum, yes. / If you ever fly over Malaya, which is going a few thousand miles away, if you ever fly over Malaya and look down you'll see nothing else but jungle but in the jungle you'll see lots and lots of big, great big holes and this is where they've been excavating for tin. And if you went to South Africa you'd find these huge holes, great clay outcasts, and I suppose that would be where they've been looking for things like diamonds or um, ah, other minerals. If you go to Northland you'll find a lot of holes in the land up there and this is where they - in the past they've dug for gum. | M-2 A/E 2/82

Now when you open up holes, a lot of rain, what do you get happening to the soil?in those holes? | CE-1 14·2

83. 1. P: Goes all mushy and it ah, the water sinks through into the other soil.

84. T: That's right and this is what we call - the soil becomes leached.

Now I wouldn't worry too much about this word leached but the rain goes through the soil and in the soil there are valuable minerals. Don't worry about this. Don't hope to know what the minerals are or anything like that. In fact I don't even, not sure what the minerals are myself but the continual rain on these places where man has dug these gum holes, gradually leaches the soil and washes away these minerals and the soil becomes what we call (WRITES ON BLACKBOARD) infertile. In other words it becomes very poor soil. | M-2 C/E

Now what do you think would be a very good way of raising the fertility, making that soil better? How could they ah, improve the soil? How would you improve the soil on your farm? Very poor soil. How would you go about improving it? Pamela? | CE-1 3·1

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7.

would you think these holes might have come from up in Northland? What would they have been digging for do you think perhaps, in Northland? Jeannie?

(1)

81. 9. P: Gum.

82. STYLE T: Gum, yes. If you ever fly over Malaya, which is going a few thousand miles away, if you ever fly over Malaya and look down you'll see nothing else but jungle but in the jungle you'll see lots and lots of big, great big holes and this is where they've been excavating for tin. And if you went to South Africa you'd find these huge holes, great clay outcasts, and I suppose that would be where they've been looking for things like diamonds or um, ah, other minerals. If you go to Northland you'll find a lot of holes in the land up there and this is where they - in the past they've dug for gum.

MORPHEMES: V HIGH 5; THL 23 24 24 19; HIGH 9; III 24; 20 8; LOW 9; 24; 9 22

21 / 11 / 111 / 111 / 33 / 111 / 11 / 52 / -1 / 16 / 4 / 112 / 3 / -11 / -131 / 12 / 13

VOICE A P ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

PER ½ ✓ ✓ ✓ ✓ ✓ ✓ ✓ 3 - -

LINES: 16

SUBORDINATION

Now when you open up holes, a lot of rain, what do you get happening to the soil?in those holes?

83. 1. P: Goes all mushy and it ah, the water sinks through into the other soil.

PHRASE STRUCTURE

84. T: That's right and this is what we call - the soil becomes leached.

STYLE STYLE

MORPHEMES: V HIGH 1; 20; 23 23 5; 24; HIGH 23 23 24 19; THL 1; 24; 22 24; LOW 20; IIII; 24; 19 23

10 22 24 / 111 / 161 / 133 / 13 / 111 / 31 / -13 / 3 / 511 / 1131 / 631 / 33 / 4 / 1 / 113

VOICE A P ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✗

PER ½ ✓ ✓ ✓ ✓ 3 -

LINES: 16 / 15 / 31

Now what do you think would be a very good way of raising the fertility, making that soil better? How could they ah, improve the soil? How would you improve the soil on your farm? Very poor soil. How would you go about improving it? Pamela?

SUBORDINATION 6 - 1 - 8 - 12 - 2

PHRASE STRUCTURE 2-2 R-6 E-0 S-2

STYLE : 0

APPENDIX 7

PRE-TEST : NORTHLAND - TEST ONE

1. TEST FORM

2. STUDENT'S RECORD FORM

Do not make any marks on these sheets.

Mark your answers on the other answer sheet.

NORTHLAND - TEST ONE

Directions

1. Do not turn over this page until you are told to.

2. Use a pencil or ball-point pen to mark the answers on the answer sheet.

3. Write your name on the answer sheet. Put your last name first.

4. Fill in the other spaces on the answer sheet.

5. When marking your answers all you have to do is to circle one of the five letters opposite each number.

   If, for example, you choose D as the right answer you would mark your answer sheet like this:

   A B C D E

   If you wish to change your answer then cross out the letter with the wrong circle and then circle your new choice.

   For example:

   A B C D E

The Aim of this Test

We want to find out how much you know about one area of New Zealand. To do this we have asked 22 short questions. Each question has five words or statements as answers. Only one is correct. You have to select the correct answer for each question. Circle the capital letter on the answer sheet which corresponds to the letter of the answer for that number on the question sheet.

Try these examples:

1. The Northland of New Zealand is

   A. In the centre of the North Island

   B. An area north of metropolitan Auckland

   C. At the northern end of the South Island

   D. At the northern side of the East Cape

   E. A few miles north of the centre of Auckland City

You should have put a ring around B opposite 1 on the answer sheet. Now try this one:

2. The Northland region extends from Wellsford to North Cape, a distance of about:

   A. 50 miles

   B. 150 miles

   C. 200 miles

   D. 250 miles

   E. 300 miles

This time C was the correct answer and you should have put a ring around C opposite 2 on the answer sheet.

DO NOT TURN OVER UNTIL TOLD TO

TEST QUESTIONS (Beginning at Question 3)

DO NOT MARK THIS SHEET IN ANY WAY

3. The largest town or city of Northland is

   A. Auckland

   B. Whangarei

   C. Dargaville

   D. Kaikohe

   E. Russell

4. To develop their farms the greatest need of most Northland farmers is for

   A. Drainage of lakes

   B. Irrigation of the farmlands

   C. Finance for machinery

   D. New experimental crops

   E. New harvesting machinery

5. Dissected hill country is

   A. Farm land cut into sections

   B. Land used for sectional farming

   C. Land divided by natural barriers such as rivers

   D. Rough land with many gullies

   E. Land cut off for purposes like milling

6. A peninsular is

   A. An island near the mainland

   B. A round projection of land with many tidal inlets

   C. Land which overhangs the sea

   D. A neck of mainland surrounded by water

   E. A group of hills surrounding a basin

7. Gumlands are areas of land in which

   A. Soils are heavy and tightly sealed together

   B. There were forests which left gum in the soil

   C. Trees are grown specially for the gum they produce

   D. There is very boggy earth or swampland

   E. There are large forests of Australian gums

8. Fertilising of farmland means

   A. Making the farmland more arable

   B. Putting new, rich soil into the farmland

   C. Applying seed to the soil of the farm

   D. Spreading manures on the land

   E. Distributing poisons to the soil for pest control

9. Most milling in Northland would produce

   A. Coffee

   B. Flour

   C. Paper

   D. Timber

   E. Tobacco

10. Encroaching sandhills are coastal sands which are

   A. Surrounded by farmland

   B. In hills covered with pasture

   C. Advancing into farmland

   D. Placed there to protect the land from flooding

   E. Move and eventually go into the sea

11. Mangrove swamps are

    A. Swamplands which are being controlled by man

    B. Swamps in sandy areas in which grow reed plants

    C. Swamps which hold decomposing or rotting trees

    D. Swamp areas surrounded by farmlands

    E. Tidal swamps of mud and sand in which grow small trees

12. Scrubland is

    A. Wasteland with bushes and small trees and little pasture

    B. Farmland which has been cleared and planted with small shrubs

    C. Pasture land in which shrubby trees are grown to prevent erosion

    D. Farmland which has pasture but also a great amount of tussock

    E. The hill country of farms covered with native forest and bush

13. Downland is

    A. Land lower than most surrounding land

    B. Low land used for dairy herds in contrast to hilly sheep country

    C. Low-lying farmland which is within a valley

    D. Land with smooth hills and dales

    E. Poor quality, stony farmland

14. Which one of these best describes reclaimed land?

A. Land being claimed again for farming

B. Useful land which was recovered from the sea

C. Farmland which was weed-infested but is now under control

D. Land sold but afterwards bought back by the first owner

E. Farmland on which earth walls are built for retaining water

15. Which of these is a harbour in Northland?

A. Maungaturoto

B. Kaipara

C. Kaikohe

D. Aropohui

E. Wellsford

16. Many of the farms in Northland are

A. Large sheep stations

B. Mixed crop farms

C. High country cattle runs

D. Experimental deer farms

E. Dairy farms

17. Which one of these was a natural resource taken in great quantities from Northland?

A. Phosphates

B. Beech

C. Kauri

D. Zinc

E. Oil

18. The rainfall of Northland is about

    A. Twice that of Canterbury

    B. One and a half that of Canterbury

    C. The same as that of Canterbury

    D. Half that of Canterbury

    E. Quarter that of Canterbury

19. One of the major problems which faces Northland farmers is

    A. The humid, wet spring seasons

    B. The absence of good transport

    C. The continual drought conditions

    D. Foot and mouth disease in animals

    E. The poor quality of much of the soil

20. The major type of fruitgrowing in Northland is

    A. Bananas

    B. Apricots

    C. Oranges

    D. Peaches

    E. Hops

21. Aerial topdressing means

    A. Spraying crops from the air with chemicals or dust poisons

    B. Distributing lime or phosphate from a plane onto the pasture

    C. Spreading lime or phosphate onto pasture from a tractor

    D. Distribution of seeds onto soil from a plane

    E. Spraying chemicals to control insects onto forests from a plane

22. Drifting sand is controlled by

A. Marram grass and trees

B. Scrub and fern

C. Tussock and matagouri

D. Kauri and rimu

E. Retaining walls and fences

NORTHLAND - TEST ONE

ANSWER SHEET Score:_____

NAME (surname first) _____ ID no._____

SCHOOL _____ FORM _____

AGE _____ (years) TODAY'S DATE _____

Practice Items:

1. A B C D E

2. A B C D E

Test Items:

3.	A	B	C	D	E	13.	A	B	C	D	E
4.	A	B	C	D	E	14.	A	B	C	D	E
5.	A	B	C	D	E	15.	A	B	C	D	E
6.	A	B	C	D	E	16.	A	B	C	D	E
7.	A	B	C	D	E	17.	A	B	C	D	E
8.	A	B	C	D	E	18.	A	B	C	D	E
9.	A	B	C	D	E	19.	A	B	C	D	E
10.	A	B	C	D	E	20.	A	B	C	D	E
11.	A	B	C	D	E	21.	A	B	C	D	E
12.	A	B	C	D	E	22.	A	B	C	D	E

End of Test.

APPENDIX 8

POST-TEST : NORTHLAND - TEST TWO

1. TEST FORM

2. STUDENT'S RECORD FORM

Do not make any marks on these sheets.

Mark your answers on the other answer sheet.

NORTHLAND - TEST TWO

Directions

1. Do not turn over this page until you are told to.
2. Use a pencil or ball-point pen to mark the answers on the answer sheet.
3. Write your name on the answer sheet putting your last name down first.
4. Fill in the other spaces on the answer sheet.
5. When marking your answers all you have to do is to circle one of the five letters opposite each number.

   If, for example, you choose D as the right answer you would mark your answer sheet like this:

   A B C D E

   If you wish to change your answer then cross out the letter with the wrong answer circled and circle your new choice, like this:

   A B C D E

The Aim of the Test

We want to find out how much you have learned about Northland. To do this we have asked 30 multiple choice questions. Each question has five answers in words or sentences. Only one of these is correct. You have to select the correct answer to each question. To indicate your answer on the answer sheet circle the capital letter which is the same as that in front of the correct answer on the question sheet. Sometimes you are told to select more than one answer. To help you not make a mistake there is a note reminding you to select two in such cases.

Try this example:

1. The Northland of New Zealand is:

   A. At the centre of the North Island

   B. An area north of metropolitan Auckland

   C. At the northern end of the South Island

   D. At the northern side of the East Cape

   E. A few miles north of the centre of Auckland City

You should have put a ring around B opposite '1' on the answer sheet. Now try this one:

2. Which two of these are features of Northland's West Coast?

   A. Oyster-covered rocky coasts

   B. Iron sand beaches

Choose

   C. Long, straight stretches of coast

<u>two</u>.

   D. Good, deep-water harbours and beaches

   E. Shaded, sandy beaches

You should have put rings around B and C opposite '2' on the answer sheet.

DO NOT TURN OVER UNTIL YOU ARD TOLD TO

TEST QUESTIONS (Beginning at Question 3)

DO NOT MARK THIS SHEET

3. The climate of Northland can be best described as generally

A. Very hot and wet

B. Very warm and dry

C. Warm and wet

D. Cool and wet

E. Cool and dry

4. The climate of Northland has some characteristic features. Select from the list below two statements which tell of these features.

A. Drought in summer with dried pastures

B. Almost all of the rain in winter months

Choose two

C. The highest range of temperatures for all of New Zealand

D. Occasional tropical cyclones in summer

E. A complete absence of frosts

5. Which two of these would best describe the east coast of Northland?

A. Short, swift rivers

B. Sounds and deep rocky harbours

Choose two

C. Sandy beaches

D. Rocky headlands

E. Iron sands

6. Northland's climate and therefore its farming, is influenced by its

   A. Extensive pastoralism

   B. Shape and relief

   C. Inland lakes and tarns

   D. High mountains and inland valleys

   E. Soil and drainage

7. Which of these best describes the main features of Northland's land?

   A. A narrow length of sandy soil holding many peat swamps

   B. A narrow strip of land mainly of inland hills with coastal flats

   C. A long range of high hills covered with dense bush and forest

   D. A narrow strip of land between two large, sandy harbours

   E. Two lowlands linked by a narrow strip of alluvial plain

8. Look at the map below.

   The dark shading ▬ shows land which is mainly

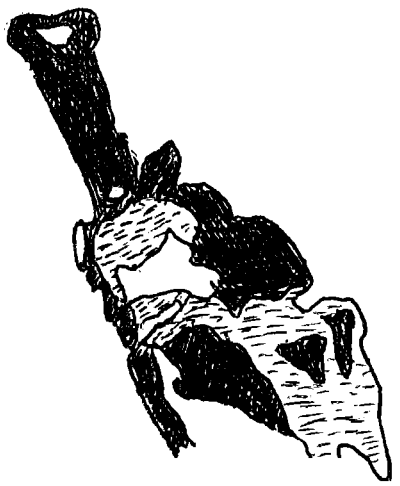
   A. Towns and cities

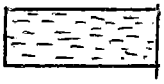
   B. Dairy and sheep farming areas

   C. Undeveloped land

   D. Market gardening areas

   E. Cash cropping and cereal growing areas



9. The shading with the broken lines  on the map shows land which is mainly used for

A. Intense cropping

B. Dairying and lamb production

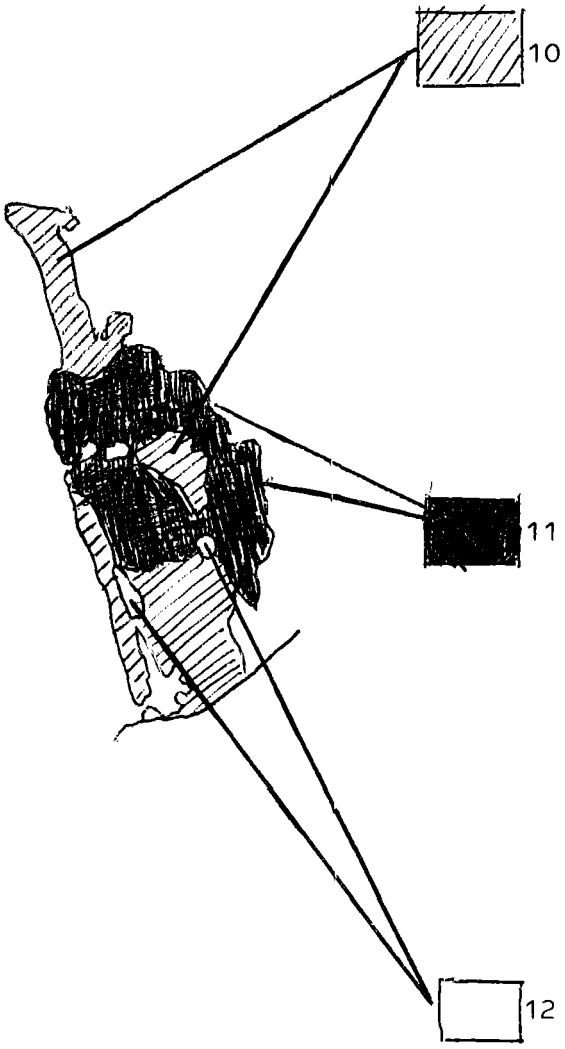
C. Plantations of exotic timber

D. Scattered sheep farming

E. Orchards and market gardening

Questions 10, 11, 12: <u>The Natural Landscape of Northland</u>

The natural landscape of Northland is varied but there are three main types. These different types of landscape are shown by different shadings in the map below. Choose the correct label for each.



10
A Dissected hill country
B Low hills and downlands
C Alluvial plains
D Mangrove swamps
E Volcanic plateau
F Encroaching sandhills
G Fertile river flats

11
A Scree slopes
B Alluvial plains
C Ironsand plains
D Encroaching sandhills
E Dissected hill country
F Low hills and downlands
G Volcanic plateau

12
A Alluvial plain
B Dissected hill country
C Lowland
D Volcanic plateau
E Downlands
F Encroaching sandhills
G Ironstone country

13. What is <u>downland</u>?

A. Smooth hills and dales

B. High hills and gullies

C. Sand dunes and swamps

D. Steep hills divided by rivers

E. Lowland with poor drainage

14. The river flats and coastal flats of Northland are mainly used for

A. Dairy farming

B. Cattle farming

C. Orchards

D. Sheep farming

E. Forests

15. One of the major problems in the farmlands of Northland's west coast is the difficulty of controlling the large belts of

A. Infertile salty soil and clay

B. Indigenous forests

C. Salty swamps

D. Encroaching sandhills

E. Lupins and coastal grasses

16. Many years ago there were large kauri and other forests in Northland. In their undeveloped condition these former forest lands are

A. Stony with good topsoil

B. Poor soil and covered with scrub

C. Rich with leaf mould

D. Fertile volcanic loam

E. Peaty and swampy

17. The name given to those areas which once grew forests and have such soils is

    A. Scrubland

    B. Downland

    C. Gumland

    D. Duneland

    E. Loam land

18. Another soil which has caused major problems for farming in Northland is

    A. Mangrove soils

    B. Forest soils

    C. Podzolised soils

    D. Takitu clay

    E. Ironstone soils

19. On the tidal edges of some of Northland's harbours and inlets there are

    A. Sand-covered deep alluvial soils

    B. Muddy raupo and flax swamps

    C. Hard salty sandstone soils

    D. Soils of pumice sand and silt

    E. Mudflats growing small swamp trees

20. Controlling these tidal areas and bringing them into farmland is called

    A. Reclamation

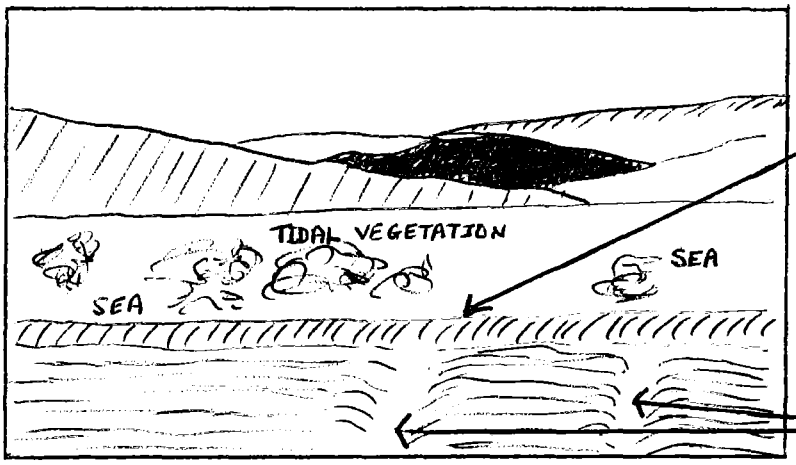
    B. Renovation

    C. Reconstruction

    D. Retrieval

    E. Revivification

21 and 22 - The diagram below shows how this is done. What are the correct labels for the parts in the diagram?



21.
- A Seawall
- B Willowfences
- C Mangroves
- D Sandhills
- E Stopbanks

22.
- A Open drains
- B Dykes
- C Mole drains
- D Weirs
- E Canals

23. The sand which threatens to cover the developed lands of Northland in some areas is controlled by the planting of

A. Lupin, pines, marram

B. Mangrove, ice-plant, scrub

C. Lupin, ice-plant, scrub

D. Marram, lupin, kauri

E. Raupo, marram, pines

24. The natural features and climate of Northland have had such a bad effect on the soil that much of the farmland there usually needs

A. Grazing

B. Fertilizing

C. Spraying

D. Irrigating

E. Reclaiming

25. Undeveloped land which is difficult and expensive to cultivate is known as

    A. Unbroken land

    B. Border land

    C. Infertile land

    D. Marginal land

    E. Unpastured land

26. When a Northland farmer wants to begin developing the unused land on his farm he usually

    A. Burns the scrub and controls the scree erosion

    B. Clears bush, fertilises the soil and plants scrub

    C. Pushes back mounting sand with machinery and sows grass seed

    D. Clears the scrub and bush with machinery and spreads lime

    E. Irrigates, discs, and rolls the land with machinery

27. When a farmer has cleared undeveloped land to prepare it for farmland he then

    A. Rolls, sows, limes, fertilises

    B. Limes, rolls, sows, fertilises

    C. Sows, rolls, limes, fertilises

    D. Fertilises, limes, sows, rolls

    E. Fertilises, rolls, sows, limes

28. Some poor quality, undeveloped land in Northland has been used well for

    A. The introduction of orchard farming

    B. Ironsand production

    C. Plantation of exotic trees

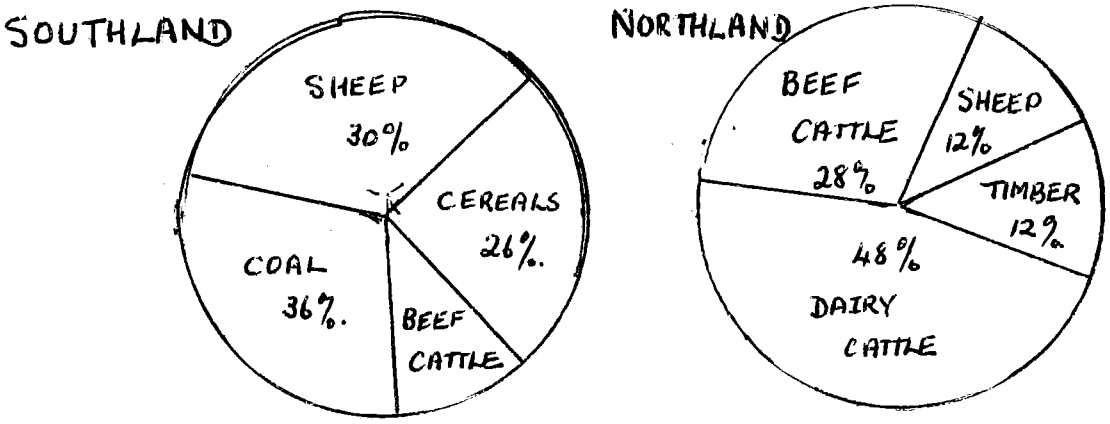
    D. Marram grass seed production

    E. Development of flax farming

Questions 29 and 30 - <u>The Use of the Land</u>

The diagrams below show the way land is used in Southland and in Northland. The sizes of the sections in the circles show the amount produced from each type of farming.

It can be seen that there was more produced from sheep farming in Southland than was produced from cereal crops.



29. Generally there are no cereals produced in Northland but in Southland a quarter of the farm produce is cereals. Why? (Choose two answers.) (Note: Cereal crops are crops such as wheat, barley, etc.)

Choose <u>two</u>

A. Northland's land and soil isn't suitable for cereal crops

B. There is greater demand for cereal crops in the South Island

C. Less profit is made from cereal crop growing than cattle farming

D. Not much land in Northland is suitable for ploughing

E. The Southland climate is more suitable for growing cereals

30. Now look at the diagram of Northland's farm production. Why is there much more cattle and dairy farming in Northland than sheep farming?

    A. More sheep are needed per acre than head of cattle per acre

    B. North Island's greater population needs more dairy products

    C. Year-round grass growth is suitable for dairy and cattle farming

    D. Cattle can tolerate the salty soil better than can sheep

    E. Cattle can graze more easily on Northland's sandy soils

31. In Northland the fruits produced for sale outside the region are

    A. Stone fruits (apricots and peaches)

    B. Berry fruits (raspberries and boysenberries)

    C. Exotic fruits (chinese gooseberries and bananas)

    D. Pip fruits (apples and pears)

    E. Citrus fruits and sub-tropical fruits (lemons and oranges)

32. There are now large areas of indigenous (native) forest in Northland. The most common tree in these forests is

    A. Kauri

    B. Rimu

    C. Pinus

    D. Pohutukawa

    E. Totara

NORTHLAND

ANSWER SHEET FOR TEST TWO

Score:_____

NAME (surname first) _____ ID no._____

SCHOOL _____ FORM _____

Age last birthday _____ Today's date _____1971

Practice Items: 1. A B C D E

2. A B C D E (2 answers)

Test Items:

3.	A	B	C	D	E			18.	A	B	C	D	E		
4.	A	B	C	D	E	(2 ans.)		19.	A	B	C	D	E		
5.	A	B	C	D	E	(2 ans.)		20.	A	B	C	D	E		
6.	A	B	C	D	E			21.	A	B	C	D	E		
7.	A	B	C	D	E			22.	A	B	C	D	E		
8.	A	B	C	D	E			23.	A	B	C	D	E		
9.	A	B	C	D	E			24.	A	B	C	D	E		
10.	A	B	C	D	E	F	G	25.	A	B	C	D	E		
11.	A	B	C	D	E	F	G	26.	A	B	C	D	E		
12.	A	B	C	D	E	F	G	27.	A	B	C	D	E		
13.	A	B	C	D	E			28.	A	B	C	D	E		
14.	A	B	C	D	E			29.	A	B	C	D	E	(2 ans.)	
15.	A	B	C	D	E			30.	A	B	C	D	E		
16.	A	B	C	D	E			31.	A	B	C	D	E		
17.	A	B	C	D	E			32.	A	B	C	D	E		

End of Test.

APPENDIX 9

TEST OF VERBAL ABILITY :

CHILDREN'S ASSOCIATIVE REASONING TEST

1. TEST FORM

2. STUDENT'S RECORD FORM

Do not make any marks on this booklet.

Mark your answers on the separate answer sheet.

CHILDREN'S ASSOCIATIVE REASONING TEST

Directions

1. Do not make any marks on this booklet, and do not open the booklet until you are told to do so.

2. For this test you will need a pencil or a ball-point pen.

3. Write your name on the separate answer sheet in the space provided. Put your last name first and then your first name.

4. Write the name of your school in the space below your name.

5. Write your age in years in the space below your school.

6. Write the date of your next birthday and today's date in the next two spaces.

   Write the number of the day and the number of the month in the spaces provided.

   For example, if your birthday is on March 23rd put 3 in the space before 'MONTH' and 23 in the space before 'DAY'.

7. Circle the words on the separate answer sheet which tell your sex, and form. If you are a boy circle 'BOY' on the answer sheet; if you are in form 2 circle '2'.

8. When marking your answers, all you have to do is to circle ONE of the five numbers. If, for example, you choose '2' you would mark it as follows:

   1 2 3 4 5

   If you have marked the wrong number, and wish to change your answer, cross out the circle and then circle your new choice. For example:

   1 2 3 4 5

INSTRUCTIONS

Look at the following example:

Example A Sweet is to sugar as sour is to:

1. candy 2. peach 3. lemon 4. bread 5. knife

The correct answer is, of course, "lemon". "Sweet" describes the taste of "sugar" just as "sour" describes the taste of "lemon", so the number "3" is circled on your answer sheet.

Now, circle the number of the correct answer in the next example:

Example B Big is to little as wide is to:

1. black 2. round 3. narrow 4. down 5. tall

You should have circled the "3" on your sheet. "Narrow" relates to "wide" in the same way that "little" relates to "big".

Be careful on the next example:

Example C Horse is to colt as cow is to:

1. field 2. milk 3. kitten 4. people 5. calf

"Calf" is the correct answer, so you should have circled "5" on your answer sheet. A "calf" is a young "cow", just as a "colt" is a young "horse".

Here is one more example:

Example D Father is to mother as uncle is to:

1. cousin 2. brother 3. sister 4. aunt 5. man

"Aunt" is the right answer because it is related to "uncle" in the same way as "mother" is related to "father". You should have circled "4" on your answer sheet.

This test contains 67 items like Examples A, B, C, and D. For each item circle the number (on your answer sheet) of the one answer you think is best. Do not circle more than one answer for any item. Remember, if you make a mistake, cross it out. Do not skip any items, but do not spend too much time on any one item. Guess if you are not sure of the correct answer.

Remember - do not skip any items.

1. Pig is to boar as dog is to:

   1. cat 2. smoke 3. ant 4. turtle 5. wolf

2. Sun is to solar as moon is to:

   1. lunar 2. radar 3. sonar 4. diameter 5. motor

3. House is to build as carpet is to:

   1. rug 2. melt 3. weave 4. grand 5. coat

4. Keep is to retain as have is to:

   1. pain 2. lot 3. power 4. recess 5. possess

5. Birds is to peck as kittens is to:

   1. punch 2. cat 3. box 4. scratch 5. ram

6. Animal is to zoo as blossom is to:

   1. footpath 2. picture 3. paper 4. flowers 5. garden

7. Taller is to height as broader is to:

   1. stiff 2. overcome 3. amount 4. long 5. width

8. Slowly is to walk as quietly is to:

   1. rang 2. speak 3. want 4. open 5. fall

9. Clear is to glass as hard is to:

   1. steel 2. left 3. sweet 4. out 5. soft

10. Defend is to attack as for is to:

    1. great 2. yet 3. laugh 4. pray 5. against

11. Teach is to teacher as sell is to:

    1. shade 2. pole 3. merchant 4. buy 5. postman

12. Food is to starved as sleep is to:

    1. exhausted 2. create 3. switch 4. needed 5. feared

13. Bear is to cave as boy is to:

    1. top 2. letter 3. girl 4. shell 5. house

14. Wish is to future as memory is to:

    1. think 2. mind 3. head 4. past 5. hunter

15. Hungry is to fed as afraid is to:

    1. shoes 2. wrote 3. scared 4. protected 5. told

16. And is to both as or is to:

    1. way 2. either 3. tell 4. only 5. nugget

17. Bigger is to enlarge as clearer is to:

    1. camera 2. explain 3. easy 4. word 5. photo

18. Beggar is to rags as king is to:

    1. queen 2. high 3. robes 4. far 5. page

---

19. When is to time as how is to:

    1. brush 2. turn 3. method 4. if 5. yes

20. Furnace is to cold as lamp is to:

    1. strange 2. coloured 3. paw 4. dark 5. light

21. Prize is to awarded as wish is to:

    1. avoided 2. sent 3. liked 4. counted 5. granted

22. Bee is to hive as man is to:

    1. pepper 2. tree 3. woman 4. nest 5. city

23. Island is to oasis as ocean is to:

    1. water 2. second 3. start 4. desert 5. distant

24. Hedge is to trim as bed is to:

    1. crate 2. root 3. sleep 4. make 5. saw

---

25. There is to where as because is to:

    1. are 2. no 3. why 4. time 5. need

26. Speedy is to rabbit as slow is to:

    1. snail 2. garage 3. fit 4. lunch 5. fast

27. Truck is to crane as carry is to:

    1. heavy 2. lift 3. heap 4. strong 5. weight

28. Begin is to start as happen is to:

    1. occur 2. depart 3. watch 4. send 5. go

29. Under is to below as on is to:

    1. sport 2. above 3. pencil 4. off 5. ran

30. Your is to yours as my is to:

    1. his 2. our 3. you 4. hers 5. mine

---

31. Sorrow is to happiness as trouble is to:

    1. rest 2. success 3. give 4. seek 5. axe

32. Mouse is to trap as bug is to:

    1. let 2. insect 3. ocean 4. toss 5. spray

33. Pleasant is to unpleasant as music is to:

    1. noise 2. pottery 3. pretty 4. nice 5. play

34. Five is to number as black is to:

    1. white 2. grow 3. colour 4. plant 5. hardware

35. Banana is to apple as long is to:

    1. salad 2. short 3. cape 4. round 5. sour

36. Wing is to fin as eagle is to:

    1. able 2. bird 3. show 4. fish 5. hint

---

37. One is to many as that is to:

    1. it 2. of 3. sold 4. those 5. owner

38. Court is to tennis as table is to:

    1. ping-pong 2. spread 3. skate 4. chair 5. football

39. Bright is to sunny as dark is to:

    1. wax 2. fur 3. light 4. cloudy 5. thin

40. Replace is to another as restore is to:

    1. cost 2. lean 3. original 4. took 5. tack

41. Tiny is to baby as tall is to:

    1. short 2. reach 3. spark 4. giant 5. rear

42. Deep is to dive as high is to:

    1. climb 2. wash 3. seem 4. sure 5. low

---

43. Hand is to throw as foot is to:

    1. trip 2. ground 3. kick 4. ache 5. crawl

44. Buy is to buyer as take is to:

    1. price 2. store 3. hold 4. sale 5. thief

45. Sorrow is to cry as joy is to:

    1. happy 2. live 3. red 4. walk 5. sing

46. Eye is to needle as head is to:

    1. nail 2. sun 3. pen 4. tractor 5. blade

47. Saw is to wood as scissors is to:

    1. sit 2. string 3. cut 4. front 5. mouse

48. For is to reader as by is to:

    1. robbed 2. plain 3. master 4. author 5. donate

---

49. Graceful is to dancer as swift is to:

1. corn 2. runner 3. pit 4. table 5. fast

50. Investigate is to detective as examine is to:

1. pilot 2. hear 3. see 4. doctor 5. ill

51. Cold is to ice as salty is to:

1. party 2. plate 3. nuts 4. glass 5. napkin

52. Across is to floor as up is to:

1. farm 2. down 3. smile 4. ugly 5. stairs

53. Those is to several as the is to:

1. near 2. time 3. under 4. message 5. one

54. Piano is to fingers as whistle is to:

1. lips 2. throat 3. loud 4. face 5. song

---

55. Castle is to king as cottage is to:

1. track 2. house 3. peasant 4. march 5. juice

56. Girl is to doll as woman is to:

1. baby 2. shovel 3. brick 4. man 5. truck

57. Is is to now as was is to:

1. along 2. today 3. then 4. nor 5. tomorrow

58. Why is to reason as who is to:

1. thing 2. what 3. mystery 4. learn 5. person

59. Red is to crayon as white is to:

1. shake 2. mud 3. yard 4. chalk 5. black

60. Multiply is to product as add is to:

1. brown 2. subtract 3. field 4. eye 5. sum

---

61. Yes is to no as allow is to:

    1. refuse 2. answer 3. punish 4. help 5. aid

62. Car is to petrol as you is to:

    1. me 2. over 3. bin 4. food 5. oh

63. Blue is to colour as sad is to:

    1. most 2. mood 3. get 4. happy 5. ton

64. Always is to never as usually is to:

    1. returned 2. all 3. seldom 4. however 5. since

65. Like is to love as comfort is to:

    1. glad 2. coat 3. luxury 4. cold 5. help

66. Build is to destroy as maintain is to:

    1. never 2. quite 3. when 4. combine 5. neglect

67. Lose is to loss as get is to:

    1. fail 2. gain 3. gone 4. give 5. rent

Please go back and do any items you have skipped.

ANSWER SHEET

CHILDREN'S ASSOCIATIVE REASONING TEST

NAME _____ SEX: BOY GIRL

SCHOOL _____ FORM: 1 2 3

AGE LAST BIRTHDAY _____ YEARS

NEXT BIRTHDAY _____ MONTH _____ DAY

TODAY'S DATE _____ MONTH _____ DAY

Practice Examples

A. 1 2 3 4 5

B. 1 2 3 4 5

C. 1 2 3 4 5

D. 1 2 3 4 5

CLASS ID NO. RIGHT WRONG OMIT FOIL

Start Test Here

1. 1 2 3 4 5
2. 1 2 3 4 5
3. 1 2 3 4 5
4. 1 2 3 4 5
5. 1 2 3 4 5
6. 1 2 3 4 5
7. 1 2 3 4 5
8. 1 2 3 4 5
9. 1 2 3 4 5
10. 1 2 3 4 5
11. 1 2 3 4 5
12. 1 2 3 4 5
13. 1 2 3 4 5
14. 1 2 3 4 5
15. 1 2 3 4 5
16. 1 2 3 4 5
17. 1 2 3 4 5
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29. 1 2 3 4 5
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32. 1 2 3 4 5
33. 1 2 3 4 5
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66. 1 2 3 4 5
67. 1 2 3 4 5

APPENDIX 10

PUPIL ATTITUDE QUESTIONNAIRE :

NORTHLAND - QUESTION PAPER 'A'

NORTHLAND

QUESTION PAPER 'A'

You have been learning about Northland.

We would like you now to answer the questions below.

Your answers will help us to understand how people learn in classroom lessons. It is most important that your answers show your real thoughts.

This paper will be seen and used only by the person giving the test.

Now fill in the details below.

Name: _____ Class: _____

School: _____

ANSWER THE QUESTIONS BY WRITING ON THIS PAPER.

1. (a) Have you always lived in Christchurch? _____

If your answer was 'No' say where else you have lived: _____

_____

(b) Have you ever visited Northland? _____

If so, how long were you there? _____

2. (a) What will you do when you leave Secondary School?

_____

(b) What is your Father's occupation? _____

(c) What is your Mother's occupation? _____

3. Put a cross in the first column below next to the books you use often (or fairly often) for homework projects, or for general knowledge.

   Then for the books you crossed say where the book is by crossing one of the other columns.

BOOK	Cross here if used often or fairly often.	WHERE DID YOU GET IT? School Library	Class Library	Public Library	Home	Some Other Place (say where)
Any encyclopedia						
National Geographic						
Any book on New Zealand						
The Student's Digest						
The Weekly News						
Journal of Agriculture						
Others (write below)						

Directions: For the following questions put a cross in the box which is opposite the right answer.

Put a cross in one box only.

4. (a) How much use or benefit do you think Social Studies has for pupils in your class now, while at School?

No use to us
A little use to us
Quite a lot of use to us
A great deal of use to us
It is more use to us than any other subject

(b) How much use or benefit do you think Social Studies will have for the pupils of your class after they leave School?

No use to us when we've left School
A little use to us when we've left School
Quite a lot of use to us when we've left School
A great use to us when we've left School
More useful than any other knowledge

5. Where do you most like getting your Social Studies information from?

Cross only <u>one</u>

From my own reading
From movies shown to the class
From filmstrips shown in class
From the usual classroom lessons a teacher takes
From the type of lessons we had on Northland

6. How many lessons have you had before on Northland?

None previously on Northland
One previously on Northland
More than one lesson previously on Northland

7. How much have you read about Northland since we began the present lessons?

No reading at all about Northland
A little reading about Northland
A fair bit of reading about Northland
A great amount of reading about Northland

8. How much did you learn about Northland from these lessons?

Nothing new was learned
A little new information was learned
A fair bit of new information was learned
A great deal of new information was learned

9. How interesting did you find the lessons on Northland?

The lessons were boring
The lessons were a little interesting
The lessons were fairly interesting
The lessons were very interesting
The lessons were the most interesting I've had

10. How interesting do you find Social Studies usually?

Social Studies lessons are usually boring
Social Studies lessons are usually a little interesting
Social Studies lessons are usually fairly interesting
Social Studies lessons are usually very interesting

11. How hard did you find these lessons on Northland?

The lessons were very hard
The lessons were fairly hard
The lessons were fairly easy
The lessons were simple

12. Which of these is true?

Usually the Social Studies lessons are very hard
Usually the Social Studies lessons are fairly hard
Usually the Social Studies lessons are fairly easy
Usually the Social Studies lessons are easy

13. How hard to understand were the things that were said?

Very little of the things said could be understood
Some of the things that were said could be understood
Most of the things said could be understood
All of the things said could be understood

14. When you compare most of the Social Studies lessons with the Northland lessons:

There was more answering of questions in the Northland lessons than in the usual Social Studies lessons
There was about the same amount of answering of questions in the Northland lessons as in the usual Social Studies lessons
There was less answering of questions in the Northland lessons than in the usual Social Studies lessons

15. When you compare most of the Social Studies lessons with the Northland lessons:

There were more opinions or ideas given by the class in the Northland lessons than in the usual Social Studies lessons
There was about the same amount of giving of opinions or ideas in the Northland lessons as in the usual Social Studies lessons
There were fewer opinions or ideas given by the class in the Northland lessons than in the usual Social Studies lessons

16. In some lessons in School there is discussion or argument. Compare the Northland lessons with the usual Social Studies lessons. Which of these statements is true:

There was more argument or discussion in the Northland lessons than in the usual Social Studies lessons
There was about the same amount of argument or discussion in the Northland lessons as in the usual Social Studies lessons
There was less argument or discussion in the Northland lessons than in the usual Social Studies lessons

17. Below is a list of School subjects. Say how much answering of questions by the class there is in each subject by putting a cross in one column opposite each subject.

	No answering of questions	A little answering of questions.	A fair amount of answering of questions.	A lot of answering of questions.	A great deal of answering of questions
English					
Science					
Social Studies					
Music					
Mathematics					
Art					

18. Now say how much argument or discussion there is in the subjects listed below by putting a cross in one column opposite each subject.

	No discussion or argument	A little discussion or argument	A fair amount of discussion or argument	A lot of discussion or argument	A great deal of discussion or argument
English					
Science					
Social Studies					
Music					
Mathematics					
Art					

19. Show which of these subjects you like the most by marking each with a number in their order of favouritism.

For the subject you like most put the number 1; the next most favourite subject would be marked 2; and so on down to 6.

	NUMBER
English	
Science	
Social Studies	
Music	
Mathematics	
Art	

Do not use the same number twice.

20. Say why you like the subjects you have graded 1 and 2 above.

The Subject I graded as '1' I like the most of all these subjects because:

_____

_____

_____

_____

The Subject I graded as '2' I like because _____

_____

_____

_____

_____

APPENDIX 11

INTERCORRELATION TABLES FOR TEACHER AND PUPIL VARIABLES

TABLE LXXIV

Intercorrelations among Teacher Variables 1-31

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	19	20	21	22	23	24	25
1.		-.250	-.056	.713	.387	.067	-.115	.051	.226	-.519	-.185	.107	-.058	-.284	-.422	-.104	-.312	.077	-.341	.296	-.294	.060
2.			.034	-.180	-.602	-.027	.145	-.241	-.093	.453	-.377	.043	.320	-.504	-.393	-.085	.001	.293	-.101	-.040	.224	.277
3.				.075	-.621	.082	-.226	.318	.194	.095	.221	-.002	-.460	.326	-.320	.038	-.196	.364	-.237	.002	.019	-.054
4.					.289	-.279	-.378	-.230	-.015	-.487	-.295	.235	.079	.027	-.354	-.414	.154	.492	-.068	.478	-.529	.233
5.						-.020	-.046	-.125	-.147	-.598	-.029	-.060	.003	.202	.078	-.119	.014	-.399	.355	.233	-.292	.010
6.							.796	.454	-.029	.030	-.296	-.275	-.221	-.177	-.210	.296	-.364	.069	-.191	-.235	.341	-.310
7.								.343	-.012	.381	-.428	-.373	-.006	-.295	-.140	.102	-.080	-.003	-.226	-.152	.640	-.197
8.									.721	.235	-.204	-.265	-.537	-.114	-.234	-.229	-.476	-.225	-.292	.364	.534	.193
9.										.252	-.304	-.114	-.236	-.343	-.259	-.412	-.159	-.139	-.221	.489	.375	.277
10.											-.133	-.334	-.126	-.304	.014	-.299	.215	-.021	-.217	.104	.789	.306
11.												.126	-.233	.484	.500	.537	-.185	-.391	-.119	-.473	-.204	-.333
12.													.550	-.277	.036	.273	-.234	.335	-.067	-.200	-.362	-.177
13.														-.421	.126	.292	.346	.400	.164	-.394	-.303	-.397
14.															.269	.060	.231	-.143	.361	-.063	-.292	-.162
15.																.368	.345	-.260	.184	-.463	-.213	-.323
19.																	-.257	-.065	-.066	-.949	-.232	-.849
20.																		.348	.399	-.005	-.173	-.097
21.																			-.175	-.029	-.323	-.167
22.																				-.043	-.189	-.021
23.																					-.165	.850
24.																						.246

	26	27	28	29	30	31
1. Primary Questions: defining	-.066	.005	-.033	-.064	.131	.322
2. describing	-.125	-.054	.017	.158	-.075	-.135
3. procedural description	.500	.359	-.309	-.365	-.338	.095
4. giving examples	-.405	-.392	.253	.375	.346	.762
5. naming	-.219	-.292	.223	.269	.292	.286
6. stating	.549	.380	-.434	-.294	-.059	-.165
7. exercises	.259	.262	-.291	-.215	-.019	-.160
8. reporting general	.417	.626	-.689	-.571	-.098	.012
9. personal reporting	.099	.335	-.410	-.277	.001	.061
10. evaluating	-.058	.235	-.269	-.155	-.038	-.252
11. opining	.269	.204	.093	-.434	-.346	-.469
12. classifying	.124	.149	-.138	-.080	-.230	-.110
13. comparing & contrasting	-.148	-.375	.355	.457	.019	-.129
14. conditional inferring	.047	-.196	.306	.047	-.076	.246
15. explaining	-.242	-.200	.320	.077	.139	-.392
19. Episode Relevance: content relevant	.577	.235	.017	-.317	-.479	-.704
20. analogous digression	-.535	-.751	.657	.761	.422	.301
21. incidental digression	-.038	-.339	.207	.386	.266	.452
22. negative analogous digression	-.124	-.293	.133	.581	.119	.009
23. tangential digression	-.455	-.099	-.124	.143	.432	.720
24. procedural digression	.249	.604	-.625	-.474	-.322	-.310
25. managerial digression	-.557	-.024	-.160	.095	.326	.429
26. Questions Per Hour		.695	-.589	-.606	-.660	-.462
27. Episode Length: 1 1-10 lines			-.919	-.879	-.715	-.519
28. 2 11-20 lines				.657	.552	.325
29. 3 21-30 lines					.567	.460
30. 4 31-40 lines						.601
31. 5 41 and above						

TABLE LXXV

Intercorrelations between Teacher Variables 1-31 and Teacher Variables 32-54

	Monologue Design			Monologue Type							Monologue Length	
	Summ.	Intro.	Expos.	Over.	Cont.	Inci.	Anal.	Neg. Anal.	Tang.	Proc. & Man.	Low	High
	32	33	34	35	36	37	38	39	40	41	42	43
1. Primary Questions: defining	-.056	.006	.004	.248	-.505	.343	-.020	.132	.375	.467	-.157	.382
2. describing	.163	-.460	.155	.581	-.255	.125	-.074	.022	-.072	.187	.159	.233
3. procedural descr.	-.103	.316	-.087	.001	.156	-.109	-.263	-.014	-.050	-.423	-.215	-.100
4. giving examples	.032	-.266	.258	.149	-.546	.445	.173	.028	.477	.087	-.498	.458
5. naming	.063	.127	-.186	-.294	-.225	-.129	.310	.003	.354	.285	-.327	.220
6. stating	-.289	.454	-.147	-.212	.303	.100	-.436	.250	-.183	.368	.167	-.270
7. exercises	-.411	.261	.125	-.230	.242	.005	-.081	.133	-.168	.208	.202	-.349
8. reporting general	-.772	.531	.276	-.410	.015	-.264	-.110	.048	.321	-.126	.231	-.134
9. personal reporting	-.522	.055	.420	-.034	-.351	-.103	.142	.464	.434	-.086	.156	.117
10. evaluating	-.330	-.160	.395	-.100	.047	-.178	.261	-.157	-.004	-.335	.320	-.205
11. opining	.311	.350	-.506	-.083	.515	-.351	-.190	-.108	-.458	-.248	.119	-.309
12. classifying	-.086	-.122	.168	-.030	.236	.111	-.470	.781	-.256	.330	.181	-.243
13. comparing & contrasting	.223	-.319	-.003	.206	.148	.431	-.026	.379	-.443	.414	.057	-.255
14. conditional inf.	.274	.306	-.400	-.277	.258	-.351	.175	-.447	-.041	-.662	-.511	-.049
15. explaining	.278	-.124	-.128	-.161	.535	.150	-.119	-.197	-.496	-.241	.445	-.350
19. Episode Relevance: content relevant	.350	.363	-.596	.092	.755	.093	-.581	.254	-.894	.288	.322	-.587
20. analogous digression	.377	-.471	.037	.037	-.061	.338	.541	-.371	-.071	-.373	-.362	.012
21. incidental digression	.054	-.203	.108	.185	.001	.631	-.232	.297	-.153	.107	-.320	-.017
22. negative analogous digr.	.310	-.240	-.100	-.252	.007	-.172	.397	-.178	.092	-.237	-.237	-.008
23. tangential digression	-.431	-.192	.538	-.103	-.788	-.156	.454	-.164	.965	-.165	-.316	.640
24. procedural digression	-.634	.165	.430	-.355	.075	-.494	.230	.031	.136	-.213	.316	-.311
25. managerial digression	-.274	-.409	.560	.067	-.734	-.204	.339	-.248	.838	-.173	-.006	.677
26. Questions Per Hour	-.256	.759	-.387	-.322	.583	-.343	-.417	.429	-.415	.128	.048	-.603
27. Episode Length: 1 1-10 lines	.297	.483	.230	-.384	.353	-.495	-.331	.380	-.073	-.034	.486	-.472
28. 2 11-20 lines	-.633	-.357	-.403	.493	-.182	.393	.226	-.429	-.160	-.015	-.419	.361
29. 3 21-30 lines	.744	-.576	-.060	.211	-.371	.477	.416	-.246	.166	.062	-.433	.381
30. 4 31-40 lines	.509	-.312	.016	.191	-.449	.507	.109	-.222	.354	.205	-.213	.566
31. 5 41 and above	.160	-.129	.220	-.012	-.583	.209	.317	-.165	.653	-.141	-.702	.558

- continued -

TABLE LXXV
continued

		Mono-logue Freq.	Lexicon -Grades Below 4	4	6	8	10	12	N/C	Morphemes Per Group High	Mod.	Low
		44	45	46	47	48	49	50	51	52	53	54
1. Primary Questions:	defining	-.289	.058	-.315	-.082	.081	.106	-.120	.049			
2.	describing	.097	.358	-.358	-.389	.389	.084	.657	.013	.275	-.343	.028
3.	procedural descr.	.030	.025	.188	-.153	.006	-.201	.129	.219	-.231	-.368	.503
4.	giving examples	-.561	.233	-.319	-.031	-.256	.209	-.136	-.281	-.156	-.059	.187
5.	naming	-.238	.340	.216	-.148	-.335	-.044	-.542	-.181	-.150	.312	-.116
6.	stating	-.165	.118	-.231	-.185	-.143	.268	.131	.086	-.160	.348	-.136
7.	exercises	-.054	.214	-.367	-.331	.068	.223	.244	-.162	.151	.228	-.318
8.	reporting general	-.043	.430	-.094	-.513	-.189	-.231	-.052	.307	.301	-.121	-.174
9.	personal reporting	.068	.110	-.122	-.323	.199	-.145	.035	.396	.532	-.125	-.378
10.	evaluating	.473	.022	-.170	-.140	.318	-.172	.217	-.042	.559	-.290	-.270
11.	opining	.555	-.176	.696	.156	.061	-.386	-.282	.168	-.154	-.075	.198
12.	classifying	-.401	.057	-.098	.222	-.141	-.016	-.163	-.402	-.195	-.232	.361
13.	comparing & contrasting	-.372	-.233	-.425	.402	.078	.375	.071	-.303	.059	.127	-.154
14.	conditional inferring	.062	.163	.680	-.176	-.321	-.188	-.210	-.001	-.616	.003	.551
15.	explaining	.312	-.300	.290	.408	-.238	.253	-.163	.085	-.190	.478	-.212
19. Episode Relevance:	content relevant	.116	-.449	.169	.428	.144	.131	.023	.151	-.321	.388	-.022
20.	analogous digression	.001	-.158	-.024	.175	-.056	.416	.014	-.158	-.081	.232	-.114
21.	incidental digression	-.501	.015	-.452	.048	-.234	.558	.277	-.217	-.221	-.142	.313
22.	negative analogous digr.	-.274	-.084	.206	.384	-.175	-.114	-.383	-.211	-.468	.344	.145
23.	tangential digression	-.166	.531	-.121	-.521	-.192	-.214	-.079	-.068	.317	-.426	.057
24.	procedural digression	.302	.296	-.123	-.394	.341	-.420	.047	-.159	.485	-.208	-.269
25.	managerial digression	.076	.073	-.119	-.246	-.032	.299	.071	-.056	.348	-.470	.064
26. Questions Per Hour		-.030	.108	.195	-.130	.061	-.320	-.178	.115	-.151	-.048	.175
27. Episode Length: 1	1-10 lines	.090	.236	.019	-.169	.175	-.582	-.171	-.059	.138	-.179	.020
28. 2	11-20 lines	.129	-.364	.161	.157	.002	.515	.272	.163	.134	.155	-.004
29. 3	21-30 lines	-.311	-.190	-.196	.340	-.215	.483	-.011	-.118	-.183	.254	-.039
30. 4	31-40 lines	-.015	.064	-.138	-.163	-.422	.618	.161	.206	.143	.075	-.189
31. 5	41 and above	-.480	.490	-.147	-.465	-.453	.222	.028	-.176	-.128	-.275	.335

TABLE LXXVI

Intercorrelations among Teacher Variables 55-74, Phrase Subordination, Phrase Structure Vagueness and the Scientific-Emotive Dimension

		Phrase Subordination											Phrase Structure					Vague-ness	Sci-Emot.
		Simple:		Multiple:			Complex			Compound-Complex			Emb.	Left	Encl.	Rt.	Simple		
		2	3	4	5	6	7	8	9	10	11	12							
Variable		56	57	58	59	60	61	62	63	64	65	66	70	71	72	73	74	96	97
55. Phrase Subordination: Simple Stes. - No sub.	1	.460	.084	.210	-.360	-.308	-.188	.070	-.137	-.181	-.610	-.626	.228	-.184	-.278	-.416	.637	-.217	.369
56. - With 1 sub.	2		-.119	.188	.022	-.038	-.434	-.008	-.297	.026	-.484	-.401	-.363	-.137	.077	-.144	.386	-.108	.309
57. - with 2 or more subs.	3			-.735	-.294	-.026	-.041	-.281	-.219	-.511	-.144	.055	-.115	-.227	.611	.107	-.459	.358	-.131
58. Multiple Stes. - No sub.	4				.175	-.018	-.097	.119	.291	.198	.066	-.423	-.028	.155	-.481	-.350	.751	-.329	.268
59. - With 1 or 2 subs.	5					.200	.102	.095	-.572	.359	.590	.037	.186	.378	-.018	-.366	.164	-.052	-.457
60. - with 3 or more subs.	6						.065	-.296	-.028	-.192	.054	.047	-.138	.454	-.066	.021	-.070	.090	.160
61. Complex Stes. - 1 sub.	7							.164	-.256	.516	.277	.036	.323	.053	-.314	.224	-.223	-.077	-.046
62. - With 2 subs.	8								-.106	.237	.239	-.433	.083	-.133	-.251	-.007	.217	-.256	-.137
63. - With 3 or more subs.	9									-.300	-.022	.059	-.319	.037	-.057	.167	.041	.197	.450
64. Compound-Complex - No sub.	10										.194	.102	.256	.170	-.354	.019	.039	-.184	-.317
65. - With 1 or 2 subs.	11											.044	.015	.050	-.041	.066	-.072	.186	-.359
66. - with 3 or more	12												.136	-.031	.259	.426	-.775	.027	-.455
70. Phrase Structure: Embedded														-.051	-.256	-.366	.022	.034	-.178
71. Left-branching															-.036	-.511	.240	.019	.030
72. Enclosed																-.123	-.504	.533	-.093
73. Right-branching																	-.608	-.166	-.127
74. Simple																		-.277	.322

TABLE LXXVII

Intercorrelations among Teacher Variables 69, 78-97 Style Indices

	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	98
69. Negation	.213	-.263	.033	-.418	-.040	-.286	-.548	-.038	-.295	-.051	.097	-.606	-.068	-.668	.359	-.162	.179	0	-.161	-.177
78. Number Disagreement		.433	-.031	.307	-.207	.346	.425	.453	.403	.113	-.337	.452	.522	.363	-.369	-.138	.307	-.076	-.308	.282
79. Repetition			-.405	.416	-.470	.399	.204	.171	-.216	.099	-.029	-.028	.336	-.123	-.488	.124	.154	.358	-.184	-.288
80. Renewals				.169	.640	-.101	.324	.426	.189	.181	.074	.352	-.533	.144	.385	.106	-.352	.046	-.080	.514
81. Stabilisers					.192	.071	.237	.231	-.442	.115	-.370	.157	.230	.231	-.415	-.110	.222	.377	-.180	.029
82. Hesitations						-.070	.062	.123	-.061	.023	-.309	.195	-.400	.228	.262	-.140	-.255	-.327	.119	.193
83. Initial Markers							.131	.001	.263	-.155	.157	.301	.216	.195	-.041	.079	-.001	.140	-.310	-.371
84. Anacoluthon								.757	.437	.357	.325	.775	-.230	.519	-.082	.336	-.002	-.208	-.088	.672
85. Phatic Comm.									.278	.374	.238	.586	-.293	.088	.117	.307	.301	-.331	-.293	.560
86. Prosiopesis										.174	.297	.679	-.182	.417	.186	.286	-.239	-.476	-.002	.411
87. Object Deletion	.084	.108	-.286	-.021	.261	.220	-.136	-.213	-.147	.175										
88. Extraction		.298	-.480	-.248	.361	.400	.016	-.018	.098	.120										
89. General Abbreviation			-.243	.494	.101	.325	.020	-.328	.165	.650										
90. Ellipsis				.148	-.510	-.640	.507	.208	-.226	-.310										
91. Slang					-.411	.035	-.262	-.174	-.233	.302										
92. Jargon						.304	-.120	-.169	.269	.160										
93. Phrasals: Verbs							-.432	.023	.035	.176										
94. Nouns								-.189	-.153	-.059										
95. Adjectives & Adverbs									-.031	-.182										
96. Vagueness										.341										
97. Scientific-Emotive Dimension																				

TABLE LXXVIII

Intercorrelations Among Selected Pupil Variables from the Attitude Questionnaire

	Future benefit S.S.	Interest		Difficulty		Exper. Lessons				Usual S.S.		Favouritism					
		Exp.	Usual	Exp.	Usual	Under-stg.	Quest.	Opin.	Arg.	Quest.	Arg.	Engl.	Sci.	S.S.	Music	Maths.	Art
	33	42	43	44	45	46	47	48	49	52	58	62	63	64	65	66	67
32. Benefit of S.S. - immediate	0.446	0.212	0.435	0.118	0.042	0.142	0.033	-0.016	0.000	0.194	0.143	-0.089	0.022	-0.361	0.132	0.011	0.220
33. - future		0.210	0.250	0.065	0.036	0.150	0.038	0.019	0.076	0.156	0.103	0.005	0.073	-0.180	0.060	-0.074	0.076
42. Interest level - exper. lessons			0.174	0.186	0.063	0.213	0.111	0.214	0.055	0.108	0.052	0.056	-0.042	-0.090	-0.029	-0.067	0.133
43. - usual lessons				0.008	0.143	0.093	-0.098	-0.163	-0.082	0.285	0.255	-0.077	-0.040	-0.470	0.187	0.045	0.285
44. Difficulty level - exper. lessons					0.275	0.345	0.070	0.072	0.116	0.019	-0.005	0.067	-0.138	0.026	0.065	0.088	-0.096
45. - usual lessons						0.087	0.095	-0.079	0.075	0.125	0.074	0.039	-0.106	-0.120	0.059	0.102	0.006
46. Understanding level - exper. lessons							0.126	0.069	0.011	0.101	0.012	0.039	-0.186	-0.029	0.155	-0.074	0.101
47. Questions in exper. lessons								0.310	0.244	-0.087	-0.073	0.090	-0.013	0.103	-0.087	0.012	-0.074
48. Opinions expressed in exper. lessons									0.316	-0.065	-0.107	0.111	0.010	0.084	-0.181	-0.009	-0.015
49. Argument or discussion in exper. lessons										-0.023	-0.052	0.021	0.021	0.002	-0.017	0.027	-0.053
52. Questions in S.S. usually											0.410	-0.066	0.066	-0.377	0.108	0.030	0.190
58. Argument in S.S. usually												-0.216	0.010	-0.226	0.161	0.104	0.151
62. Rank order favouritism - English													-0.249	-0.009	-0.191	-0.233	-0.299
63. - Science														-0.063	-0.326	-0.094	-0.227
64. - S.S.															-0.294	-0.206	-0.297
65. - Music																-0.163	-0.012
66. - Maths.																	-0.296
67. - Art																	